AN EXAMINATION INTO THE QUALITY OF REGIONAL TRADE INSTITUTIONS: THE ECONOMIC COMMUNITY OF WEST AFRICAN STATES (ECOWAS)

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AN EXAMINATION INTO THE QUALITY OF REGIONAL TRADE INSTITUTIONS: THE ECONOMIC COMMUNITY OF WEST AFRICAN STATES (ECOWAS); A HISTORICAL, THEORETICAL AND MODELLING PERSPECTIVE

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Abstract

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"An Examination into the Quality of Regional Trade Institutions: The Economic Community of West African States (ECOWAS); a Historical, Theoretical and Modelling Perspective".

Keywords: trade institutions, convergence, history, policy, regionalism, modelling, ECOWAS, theory

This thesis examines the determinants of institutional quality and the process of convergence in the ECOWAS in order to inform policy about the region's deep integration scheme. The first part of the thesis examines the historical changes that took place in the development of common institutions in West Africa in the pre-independence era. The findings demonstrated that the region exhibited some common institutions, including common currencies, standardised trade rules and protection of trade routes which facilitated regional and international trade. A single administration system helped in the effective implementation of the common institutions. Therefore, historical changes after independence led to the loss of some facets of these common institutions in West Africa. The second part examined determinants of institutional quality and the process of convergence using econometric analysis. The findings demonstrated that the process of convergence could be accelerated if WAMZ and WAEMU work together as one monetary zone under ECOWAS. Moreover, the findings also demonstrated that the level of development, state capacity, FDI, regional trade, history and regional trade partners institutional quality contain useful information in explaining the quality of institutions today. Therefore, ECOWAS's deep integration goal would require improving some of these factors in order to facilitate the process of developing common institutions and improve their quality. In the long term, a single administration system akin to the colonial era and the Empires of Western Sudan would be desirable. This will require political commitment to do so. ECOWAS members should have the confidence that deep integration is feasible given that it existed in the region in the past.

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Table of Contents

List of Figures

List of Tables

List of Abbreviations

AMU- Arab Maghreb Union

COMESA- Common Market of Eastern and Southern Africa

CPIA- Country Policy and Institutional Assessment

EAC- East African Community

ECA- Economic Commission for Africa

ECCAS- Economic Community of Central African States

ECOWAS- the Economic Community of West African States

EDA- Economic Development in Africa

GLS- Generalized Least Square

IGAD- Intergovernmental Association for Development

IPE- Institutional Political Economy

NGOs- Non-Governmental Organization

NIE- New Institutional Economics

RCA-Revealed Comparative Advantage

RTA- Regional Trading Agreements

SADC- South African Development Community

TCI- Trade Complementarity Index

TLS- Trade Liberalization Scheme

ETLS- ECOWAS Trade Liberalization Scheme

2SLS- Two Stage Least Square

UCM- Unobserved Component Model

UNCTAD- United Nations Conference on Trade and Development

UNCTADSTAT- United Nations Conference on Trade and Development statistics

UNECA- United Nations Economic Commission for Africa, It is also called ECA

VAR- Vector Autoregressive models

WAEMU- West African Economic and Monetary Union, It also called UEMOA in French

WAMZ- West African Monetary Zone

WLS- Weighted Least Square

WTO- World Trade Organization

Glossary

Institutions- structures, systems and rules which define how humans interact with each other and with their environment

ECOWAS- the Economic Community of West African states was formed in 1975 to foster cooperation and integration in West Africa.

WAMZ- the West African Monetary Zone is composed of the five English speaking countries in West Africa and Guinea Conakry. They aim to emulate WAEMU by introducing a single currency and central bank in order to prepare ECOWAS for a single currency.

WAEMU- the West African Economic and Monetary Union is composed of eight French speaking countries and Guinea Bissau. They are a customs union with a single currency and central bank.

CHAPTER ONE

Introduction, research motivation and background

1.0 Research motivation and background

The multilateral trading system has attracted considerable debate and discussion about how the gains from trade could be spread across the world and the extent to which global free trade is more desirable than regional integration schemes (Bhagwati, and Panagariya, 1996; Schiff and Winters, 2003; Venables, 2003; Dunn and Mutti, 2005; Gupta, 2008 and Stiglitz, 2013). In other words, are north-south integration schemes more desirable than south-south integration schemes? The failure of the Doha round is in part due to the unequal distribution of gains from trade. Thus, regions are increasingly looking inward through the formation of Regional Trade Agreements (thereafter RTAs) or to strengthen past agreements in the last three decades (Gupta and Yang, 2007 and Gupta, 2008). This highlights the importance of trade as part of the overall development initiative for many countries. Almost every country is part of one or more regional trading block (Gupta and Yang, 2007). The World Trade Organization (WTO) estimated that from 1948 to 1994, they were notified of 123 RTAs and 581 in 2014 which represents a 372 % increase (WTO Report, 2014 p. 7). In Africa, the United Nations Economic Commission for Africa (UNECA) was established in 1958, advocated the formation of Regional Economic Communities (RECs) with a view to accelerating growth and poverty reduction initiatives. It was perceived that smaller sizes of individual African nations are not viable to be able to pull enough resources together in order to promote national economic development (Aryeetey and Oduro, 1996 and Borrmann and Busse, 2007).

The Economic Community of West African States (ECOWAS) was formed on the 28th of May 1975 in order to achieve an economic union status as stipulated in article 2 of the 1975 treaty and article 3 and 54 of the revised 1993 treaties (Aryeetey, 2001; Ogunfolu, 2009 and Dijk, 2011). Economic union status requires quality institutions and the harmonization of trade policy and institutional framework ((UNECA Report, 1996: Koremonos, 2001 and Ghazaleh et al, 2013). This was going to be achieved by fostering greater regional cooperation, integration and development in all fields. Furthermore, ECOWAS intends to conform to the UNECA ambitions for a united Africa. ECOWAS is composed of 15-member states, namely; Benin, Burkina Faso, Cape Verde, Cote D'Ivoire (Ivory Coast), The Gambia, Ghana, Guinea Conakry, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo (Nielsen and Zouhon-Bi, 2007 and Dada, 2013). Mauritania which was the 16th member withdrew in 2002 because they didn't want to be part of the single currency scheme (Nielsen and Zouhon-Bi, 2007).

The increase in intra-ECOWAS trade (9.95[1]% in 2014; UNCTADSTAT, 2015) is an important element of the strategy to achieve their regional integration and development goals (McLenaghan et al, 1982; Omorogbe, 1993; Aryeetey, 2001 and Assane et al, 2014). However, the increase in intra-ECOWAS trade is faced with some challenges due to the tariffs and non-tariff barriers to trade (Aryeetey, 2001; Keane et al, 2010 and UNECA Report, 2013 and ECA Report, 2013). Progress has been made in reducing tariff levels. ECOWAS became a free trade area (FTA) in 1990 with the launch of the trade liberalization scheme (TLS) although the implementation was slow (Omorogbe, 1993 and UNECA report, 2012). The common external tariff (CET) that was supposed to be launched in 2008 came into force on the 1st of January 2015 and effectively made ECOWAS a customs union (African Research Bulletin, 2015).

Nonetheless, the non-tariff barriers pose fundamental challenges to ECOWAS trade, including poor transport and communication network, non-convertibility of currencies, differences in invoicing and weak trade facilitation institutions. Some aspect of the non-tariff barriers has received attention in the existing literature, including transport and communication and currency convertibility (Aryeetey, 2001; Ajayi, 2005; Borrmanne and

Busse, 2007; Keane et al, 2010; Hertzenberg, 2011; African Union Report, 2012; Babatunde and Odularu, 2012; Acclassato, 2013; Badiane et al, 2013 and Assante et al, 2014).

We argue in this thesis that the quality of institutions could be identified as one of the non-tariff barriers that pose the greatest challenge to intra-ECOWAS trade since they are not easily visible, measurable or amendable[2] (Yansane, 1977; Ellis and Morgan, 1984; Ogunkola, 1998; Aryeetey, 2001; Borrmann and Busse, 2007; Ogunfolu, 2009; Keane et al, 2010; Leyaro and Morrissey, 2010 and UNECA Report, 2000). Furthermore, weak institutions are associated with coordination failures, uncertainty and high trade costs. This assertion is corroborated by the findings in the existing literature that ECOWAS cross-border trade cost as additional US$100 to US$129 in bribes payment per trip at border points and unofficial checkpoints which discourage regional investment and trade (Cissokho et al, 2012; Keyser, 2012 and Brenton, 2012). Additionally, 50% of intra-African trade financial settlements are done with banks outside Africa that add to trade costs. These extra costs are associated with weak institutions, including regulation of cross-border trade, protection of trade routes from bribes, non-convertible currencies and sensitization of traders about their rights under the ECOWAS protocols on the free movement of goods and people. Furthermore, the convergence of institutions, that is a prerequisite to the sustenance of any successful integration scheme, is slow within ECOWAS despite all the protocols being signed to facilitate it (UNECA Report, 2000; 2013; Koremenos, 2001; Lejarraga and Shepherd, 2013 and Ghazaleh et al, 2013).

Therefore, this thesis aims to contribute to the existing literature by examining the conjunction of factors that determine the quality of institutions and the process of convergence in the ECOWAS region as a new case study that has not been sufficiently looked at. The findings could provide useful policy implications for the ECOWAS deep integration scheme.

[2] Other non-tariff barriers that have received attention in empirical research are quotas, subsidies, standards and technical barriers to trade. Institutional qualities have just been identified as barriers to trade (Page, 2005).

The thesis is divided into three research questions that seek to examine the issue. Furthermore, the thesis is divided into six chapters where chapters' three to five addresses each of the three research questions chronologically while the other chapters consolidate the whole thesis. We argue that as a first step, research into the determinants of institutional quality could start with a holistic assessment of their development and evolution in order to enable readers to know how the present quality of institutions came about. Therefore, the first research question aims to;

1. "Examine the history of West Africa and its relations to the development of regional trade institutions from the Empires of Western Sudan to the present day"?

This will be the basis for our discussion in chapter three. We will start by reviewing the literature about trade institutions during the Empires of Western Sudan and the colonial era and how they were developed and standardized. The final part of chapter three focuses on the extent to which some facets of regional trade institutions in the past continued to exist today and how some ECOWAS institutions could consolidate the development and standardization of regional trade institutions today. Our assessment demonstrates that the Empires of Western Sudan developed regional trade institutions that were standardized across the Empires such as common currencies, common trade rules, protection of trade routes and single administration. Furthermore, our assessment also demonstrates that the colonial era also created common regional trade institutions, including common currencies and trade rules, although they were intended to promote international trade specifically with the colonial power, which created distortions rather than regional trade. We argue that historical changes in governance in the late 1950s onwards when West Africans began to gain their independence resulted in the loss of some facets of these regional trade institutions which have yet to be restored today. Therefore, the development of regional trade institutions slid backward in West Africa that had implication for regional trade. We argue that ECOWAS could reflect on its historical best practices given that the economic and political union status they are trying to achieve now existed in the past.

The second research question aims to assess the degree of ECOWAS trade relative to each other and relative to the rest of the world. Furthermore, an assessment of ECOWAS trade potential will be made by computing the revealed comparative advantage (RCA) and trade complementarity index (TCI). The second research question aims to;

2. “Assess intra-regional trade flows: the experience of the ECOWAS integration scheme”?

The motivation for this assessment hinges on the current debate and discussion about the extent to which south-south integration schemes like that of ECOWAS are less desirable than north-south integration schemes (Bhagwati, and Panagariya, 1996; Schiff and Winters, 2003; Venables, 2003; Dunn and Mutti, 2005 and Gupta, 2008). Some papers argue that RTAs that entail deeper integration schemes could experience significantly higher gains from trade because they lower trade costs, coordinate and correct market failures and provide a stable trading system which national governments alone may fail to achieve (Dunn and Mutti, 2005; Evans et al, 2006; WTO Report, 2011 and Lejárraga and Shepherd, 2013). Other papers argue that deeper integration between north-south could potentially be more beneficial because the south could learn best-practices from the north (Winters, 1996; Schiff and Winters, 2003 and WTO Report, 2011). Therefore, there is a lack of consensus on the matter. However, the undesirability of south-south integration scheme could in part, be attributed to the lack of deep integration. Some papers have associated the undesirability of south-south integration with the skewness of production structures toward international trade, lack of complementarity of production and the low production base (Aryeetey, 2001; Cernat, 2001; Hertzenberg, 2011 and UNECA Report, 2013).

To reinforce my earlier statement, this thesis asserts that weakness in the quality of institutions could make any integration scheme undesirable due to its associated costs, uncertainty and coordination failures. Therefore, assessing ECOWAS trade would enable us to know where they are in their integration process and some of the catalysts and impediments to regional trade.

The second research question will be discussed in chapter four. We will first look at trade and regional trade theories as the basis for global free trade and regional integration. This will be followed by a review of the literature in order to locate ECOWAS's position in the global and regional trade. The final part of chapter four focuses on computing ECOWAS trade potential by product category using standard international trade classification (SITC). The findings show that ECOWAS intra-regional trade is low relative to other RTAs and relative to the rest of the world due to several factors including weak institutions. Moreover, our RCA and TCI estimates suggest that ECOWAS has the potential to increase regional and international trade conditional on minimizing some of the impediments to trade including the quality of institutions.

Therefore, the third and final research question seeks to examine the conjunction of factors that determine the quality of institutions and the process of convergence in the ECOWAS region. The third research question aims to;

3. "Examine the determinants of institutional quality and the process of convergence in the ECOWAS region"?

The third research question will use econometric method and it is assumed that determining institutional quality and convergence is best examined by using the positivist quantitative approach. This will be the basis for our discussion in chapter five. Research into the determinants of institutional quality lacks a coherent methodology and models underpinned by the institutional theories. We will pull together different aspects of the institutional theories to assist us to link institutional theory to modeling and estimation. These models will be used to estimate the conjunction of factors that determine the quality of institutions using exclusive ECOWAS dataset as a new case study. Furthermore, we will use the Ben-David (1996) model to test the process of convergence of institutions since economic union status could not be sustained without harmonization of institutions. We use panel data from 1996 to 2015.

The findings demonstrate that the process of convergence is slow within ECOWAS. However, the rate of convergence could be accelerated if the West African Monetary Zone (WAMZ) and the West African Economic and Monetary Union (WAEMU) cooperate more or act as one monetary zone. Furthermore, the level of development, the capacity of the state, FDI, past institutional quality and the quality of institutions of regional trade partners contain useful information in explaining current institutional quality. Regional trade also influences regulatory quality and rule of law. The statistical significance of the rest of ECOWAS institutional quality suggest that there is a pull factor and learning from each other. Therefore, ECOWAS should be the main driver of regional integration and development. In the long run, full integration would require a single administration system akin to what existed during the Empires of Western Sudan and colonial era. We argue that ECOWAS should have the confidence that economic and political union is feasible given that it existed in the past.

1.1 Structure of the thesis

The structure of the thesis is as follows. Chapter one looks at the main research motivation and background and how to address the three research questions. Chapter two discusses the general debate within institutional economics about the definition, measurement and methodological approach in order to motivate the approach that is going to be taken in this thesis. This is useful because it allows readers to know which set of institutions is referred in the thesis and some of the weaknesses in research related to the determinants of institutional quality. For example, there is considerable debate about the extent to which the quality of institutions could be measured. Chapter three examines the historical changes that occurred in the development of regional trade institutions from the Empires of Western Sudan to the present day in order to know how the present came about (Acemoglu et al, 2001 and Nunn, 2007). Chapter four assesses the degree of ECOWAS trade and its trade potential in order to know the current state of regional trade and integration. Chapter four will also assess some of the factors driving ECOWAS integration, including the quality of regional trade institutions. Chapter five examine the conjunction of factors that determine the quality of institutions and the process of convergence. Finally, chapter six will bring together key findings from each chapter in order to draw policy implications and conclusions.

CHAPTER TWO
Assessing research approaches into the determinants of institutional quality: definition, measurement and methodology

2.0 Introduction

The aim of this chapter is to discuss some of the debates and approaches in research into the determinants of institutional quality in order to motivate our own approach in this thesis. A more detailed discussion of the approaches will be made in section 5.2. The first part of this chapter will discuss the definition of institutions in order to enable readers to know which set of institutions is referred in this thesis. The second aspect of this chapter will discuss the debates around whether institutional quality could be measured or not. This will enable us to decide whether to use a quantitative or qualitative approach. The third aspect of this chapter will discuss the methodological approaches in terms of modeling and estimation in order to motivate our own. This is useful because research in this area lacks clear models underpinned by institutional theories.

2.1 Defining institutions

There is no single definition of institutions, what it encompasses and its functions. Hence, institutions may mean different things to different people (Hodgson, 2006; Aoki, 2007; Kaufmann et al, 2010 and Kuncic, 2013). While some define institutions in the context of organizational structure (Hodgson, 2006), others see institutions as rules that determine the interaction between agents or control human interaction (North, 1990). Contrasting these two views can be difficult because they are interlinked. Organizational structures are shaped by rules while rules also shape organizational structures. This interlink has resulted in discussions about what comes first. That is, are economic interactions shaped by institutions or institutions shape interactions? Therefore, there is a need to understand the delicate difference between the two definitions in empirical research in order to allow the reader to establish the direction taken by the author. Organizational structure involves looking at the chain of management and the various departments within the organization (Powelson, 1972) while rules of the organization determine how individual and chain of management operate and interact based on consensual arrangements (Powelson, 1972 and North, 1990). Either way, institutional quality is assumed to function in order to reduce uncertainty, coordinate market activities and lower transaction costs (Furubotn and Richter, 2010 and Kuncic, 2013). These functions of institutions suggest that there should be an aspiration on the part of countries or regions to improve the quality of their institutions.

Powelson (1972) defined institutions as systems (rules) and structures (a place) that define set of relationships designed to resolve conflicts between agents by specifying the role of people in society. Conflicts here mean that decisions made by agents entail conflicting choices, hence; institutions are therefore needed to resolve these conflicts through consensus. The consensus is obtained when agents perceive mutual benefits or separate goals that require cooperation; they will build or improve institutions in order to reduce uncertainty and coordinate the cooperation. Thus, the decision to cooperate and invest in building or improving institutions is determined by the choices of agent's base on demand and supply. This has important implications since it suggests that interaction of agents determine the extent to which agents build and improve institutions. Indeed, Milgrom et al (1990); Grief et al (1992) and Puga and Trefler, (2012) found that interactions led to a demand for institutions which facilitated cooperation in the ancient period in Europe. Furthermore, Hurwicz (1996) cited by Aoki (2007) also lamented on the impossibility of designing rules (institutions) prior to playing the game which suggests that interactions determine institutional quality at least in the initial stages.

Powlson (1972) definition is consistent with the oligopoly cooperative model derived by Rosendorff and Milner (2001). In that model, it is assumed that bilateral trade barriers are derived from cooperative outcome provided the collective benefits are greater. Hence, this definition is quite useful from an RTA point of view since it indicates that regional groupings like ECOWAS are likely to establish regional institutions (rules and structures) if there is demand for them. Each nation in the RTA will have a utility function that determines the probability of investing in improving and converging regional institutions (Levechenko, 2012 and Powelson, 1972). We argue that these utilities are likely to emanate from economic interactions such as gains from trade.

Furthermore, the Global Competitiveness Index Report (2013) defined institutions as a set of legal and administrative measures where businesses, individuals and governments interact to generate wealth. This definition assumes that institutions help generate wealth, although wealth generation could also strengthen institutions? Powelson (1972) argued that the initial cultural capital and the willingness to improve or establish new institutions based on cost-benefit analysis determine their functional form, shape and evolution. Powelson (1972) assertion can be linked to the findings of Acemoglu et al (2001) and Nunn (2007) that the colonial history of Africa in part, explains the quality of their current institutions. The initial cultural capital also suggests that cultures and other economic interactions determine the quality of institutions at least in the short run, although a unidirectional causality has been contested by the Institutional Political Economic theory (IPE) (Zweynert, 2009 and Castellano et al, 2012).

North (1990) also defined institutions as constraints that political, social and economic agents use to conform to the rules of the game (norms) or prevent agents from extorting rents from other participants in a way detrimental to the general welfare. That is, institutions remove uncertainty and provide a stable form of interaction in addition to constraining agents from behaving beyond what is acceptable in society. Whether every agent conforms to the rules depend on the initial arrangements made and the quality of the institution to monitor and regulate behavior or at least initiate some form of punishment for non-conforming agents or what Rodrik (2007) called sanctioned force. Another aspect of North (1990) definition of institutions is that they emanate from the cultural norms and interaction in societies.

Hence, the definition of institutions discussed above highlights the motives behind two areas of research. The first area focuses on the determinants of institutions and institutional quality while the second focuses on the role of institutions in economic exchanges. In this thesis, we highlight that if institutions are useful in reducing uncertainty and transaction costs, there should be an aspiration to improve them. Therefore, it is useful from a policy point of view to examine the conjunction of factors that determine the quality of institutions. Some papers have demonstrated that interaction of countries within an RTA determine the quality of their institutions at least in the short run (Milgrom et al, 1990; Grief et al, 1992 and Puga and Trefler, 2012). In the long run, institutions would shape interactions.

2.2 Measuring institutional quality indices

2.2.0 Introduction

There are contrasting views about whether the quality of institutions can be measured and the extent to which they could be used for estimation in order to inform policy. The first view assumes that institutions cannot be measured since they are subjective, and, in most cases, they tend to measure policy effectiveness rather than institutional quality (Chang, 2011; Albouy, 2012 and Castellano et al, 2012). Furthermore, the application of institutions (rules) is contextual to the nature of the issue. The second view recognised that institutional quality could be difficult to measure, although measurement can provide the most comprehensive proxy about rules governing interaction (Straub, 2000 and Kaufmann et al, 2010). Furthermore, this second view argues that attempts to measure institutional quality should be treated as the first step toward a more comprehensive measure.

These debates have resulted in some papers using a qualitative or quantitative approach although the quantitative has been used limitedly. We will look at these two views in order to establish the direction that we will take in this thesis.

2.2.1 Institutional quality cannot be measured

Some papers argue that institutional quality cannot be measured because the criteria used are subjective (Chang, 2010 and Albouy, 2012). Their argument is that measuring institutional quality rely on survey data which asked people about their perception of certain institutions. Responses are then indexed into a composite value that represents the quality of institutions. They argue that responses from survey data are biased for several reasons;

I. First, economic conditions can influence the respondent's view. For example, during economic booms, a view possessed by some business managers might be different to their views in recession’s times. Hence, responses might be capturing economic performance and policy effectiveness rather than the quality of institutions (Alexander, 2010 and Chang, 2010).

II. Secondly, the criteria used to design survey questionnaires are skewed toward an economic philosophy that may be different from one country to another. Chang (2010) and Alexander (2010) have criticized the measurement of institutional quality by international institutions such as the World Bank as skewed towards the capitalist view of what quality institution should look like in one-size-fits-all criteria. Hence, if the questions were modified to capture a different philosophical stance, the composite numerical value would probably be different, although Maseland (2011) has argued that this does not invalidate the current measurement methods. For example, land rights are held by the community rather than individuals in many African societies (Rodney, 1981). As such, large commercial farming is difficult to establish in SSA due to community resistance. Since the rule of law in the world governance indicator only consider protection of individual property rights, Chang (2010) argued that the indicator did not necessarily capture the quality of institution for some countries. Hence, it can be argued that the diverse cultures of many societies across the globe make one-size fits all measurement of institutional quality difficult (Alexander, 2010).

III. Third, rules and structures cannot be quantified into a composite numerical value because the applications of the rules are contextual to specific circumstances. For example, contract enforcement rules that are binding across a group of countries like ECOWAS may be interpreted differently from one case to the other depending on the context in which the contract is honored. Hence, deriving a composite numerical value cannot capture the contextual application of institutional quality from one period to another.

IV. Alonso et al (2013) and Vogit (2013) argued that the models used to measure institutional quality face the problem of specification error given the presence of collinearity, endogeneity, omitted variable bias that renders deficiency in the institutional quality indicators. In part, if institutions are defined as rules, what determine these rules given the complexities of human behavior makes modeling difficult since it is impossible to identify all the relevant variables that capture the specific characteristics of an institution. Hodgson (1998) narrated that the introduction of mathematical economics made institutional economics redundant from its complexities are difficult to capture in a single mathematical equation.

V. Similarly, rules must be enforced by those in power. Hence, the written rules are as good as society’s willingness to adhere to them. Moreover, if those in power are not willing to enforce the rules, then it makes it difficult to ascertain whether the survey data from which institutional quality indices are computed captures the quality of enforcers or the quality of the rules in place (Kaufmann et al, 2010 p. 17).

Therefore, there are difficulties in measuring institutional quality into a composite value. Indeed, Kaufmann et al (2010) recognized that the governance indicators are a proxy since they originate from the imperfect perception of stakeholders. However, we must start somewhere with the hope that over time, an appropriate set of criteria can be used to capture the quality of an institution into a composite value that will assist future empirical research. Indeed, Acemoglu et al (2001) and Koremenos et al (2001) argued that research related to the determinants of institutional quality should take one step at a time to develop theory, quantification, models and estimation.

2.2.2 Institutional quality can be measured

Following Acemoglu et al (2001) assertion that we should start somewhere in computing institutional quality, some researchers argue that it is possible to measure the quality of institutions from survey data (Straub, 2000; Kaufmann et al, 2010; Maseland, 2010 and Alonso et al, 2013). Putting aside some of the criticism in section 2.1.1; they argue that since the survey data gauges the perception of respondents during their interaction with a particular institution, it must contain useful information about the quality of that institution and can serve as a good proxy. Thus, research that has used these indices in econometric studies is only using them as a proxy. There are many sources of institutional quality indices that have been used prominently in the existing literature namely the;

- World Economic Forum global enabling trade indices
- Country policy and institutional assessment (CPIA) of the World Bank
- Doing Business of the World Bank and
- The World Bank world governance indicators

The World Economic forum enabling trade index measures the development of institutions, policies and services, facilitating trade beyond borders for individual countries (The Global Enabling Trade Report, 2012). The composite enabling trade index is computed from four sub-indices- market access, border administration, transport and communication and business environment. Each of the four sub-indices are computed from two data sources- opinion surveys, data and hard data from public institutions and international organizations engage in trade such as UNCTAD, World Bank, World Bank Logistics index performance and WTO. The survey is based on the opinion of business people and those engage in trade across borders. Respondents are asked to rank from 1-7 their perception of factors affecting them during trade transactions.

The hard data, such as tariff rates derived from the World Bank is then normalized or rescaled within 1-7 in order to align them with the survey data scale where 1 represent best and 7 represent a worst enabling trade index. The formula for rescaling the data is found in equation 2.1 below.

$$\mathbf{6} * \left[\frac{\textbf{country score} - \textbf{sample minimum}}{\textbf{sample maximum} - \textbf{sample minimum}}\right] + \mathbf{1} \qquad (2.\ 1)$$

Where

$\text{The minimum and maximum are the lowest and highest scores of the sample}$

The final score for each index are the unweighted averages from each sub-index and data sources respectively. Although the enabling trade indices offer a useful proxy for trade institutional quality, their computation started in 2008 which offers a small data set. The CPIA and doing business indices also suffer from a similar time series issue because their computation started from 2005. Similarly, the CPIA measures the extent to which a country policy and institutional framework to promote growth and poverty reduction initiatives. Although trade can stimulate the process of growth and poverty reduction through export and income generation, the CPIA does not measure trade facilitation institutions. The doing business index also measures how effective policy and the regulatory environment is to business operations. The regulatory aspect of doing the business index can be a proxy for trade facilitation. However, there are other indices that are perhaps more appropriate as a proxy for trade facilitation with a longer time span.

Indeed, Straub (2000) highlighted that the World Bank world governance indicators offer the most comprehensive proxy for institutional quality since they cover a wide range of stakeholders whose views are compiled into a composite figure. It covers several hundred variables generated from 31 individual data sources for each country that includes some aspects of the CPIA, enabling trade indices and doing business indices (Kaufmann et al, 2010). These sources encompass opinion surveys that capture respondent's perception of institutional quality (Governance)[3] from a wide range of the public and private sector, households, NGOs, international organizations, think-tanks, and experts. Kaufmann et al (2010) then normalizes the data by combining the different data sources into a composite score. In Africa, the data sources include the African Development Bank Country Policy and Institutional Assessment (CPIA), the Afrobarometer, Global Competitiveness Report survey, Reporters without Borders, Freedom House and African Electoral index. The final score represents the perception of respondents on each indicator. The process involves;

❖ Collecting data from all the 31 different sources. The scale of measurement may be different from one source to another.

❖ An Unobserved Component Model (UCM) is then used to

a. Standardize the data into comparable units given its diverse sources

b. Aggregate all the data through weighted average method

c. And include a margin of error to capture the imprecision in measuring institutions.

❖ The composite score is simply the weighted average of all the data sources which is rescaled to lie between -2.5 and 2. 5 ranges where 2.5 represent good institutions.

The advantages of using the governance indicators from the World Bank are many. First, they are comprehensive in the sense that they encompass most of the existing institutional quality indices such as CPIA. Second, they

[3] Kaufmann et al did not make distinction between governance and institutional quality.

entail a much longer time series from 1996 to 2015 relative to the other indices. Therefore, this thesis aims to use the World Bank governance indicators as a proxy for the quality of regional trade institutions. Furthermore, research into the determinants of institutional quality should move beyond the descriptive approach. Therefore, although it is recognized that measuring institutional quality could be difficult, we take the view of Acemoglu et al (2001) and Koremenos et al (2001) that we should start somewhere by developing theory first, quantification, models, and estimation. Institutional theories have been developed.

2.3 Methodological approaches and debates

2.3.0 Introduction

In the previous section, it was demonstrated that there is no consensus on whether institutional quality could be measured or not. This has led to the use of descriptive (qualitative) and empirical (quantitative) approach or a combination of the two. Each of these approaches has their own merits and demerits underpinned by a philosophical approach (Creswell, 2009). The positivist and post-positivist are aligned with the quantitative method of research where it is argued that reality in the natural settings can be observed and measured by identifying causal relationships and effect (Creswell, 2009 and Saunders et al, 2012). In this sense, institutional quality and its determinants can be measured. However, the post-positivist argues that knowledge about absolute truth is difficult to ascertain which imply that measurements approximate the reality or reject a given hypothesis rather than the establishment of facts (Creswell, 2009 and Saunders et al, 2012). In contrast, the interpretivism/constructivists are aligned with the qualitative research approach where individual are assumed to develop subjective meanings of their experiences of the world (Creswell, 2009 and Saunders et al, 2012). These meanings vary and take multiple shapes that lead the researcher looking for complexities embedded within the subject being studied. As such, the researcher avoids narrowing the meanings into a few categories and ideas. Instead, participant’s view of the situation is constructed as the given nature of the relationship (Schwandt, 2007 and Creswell, 2009).

These philosophical debates have motivated the general methodological approaches to research. However, in the context of determining a phenomenon, we argue in this thesis that it is not sufficient to highlight the determinants of institutional quality within the interpretivism/constructivists paradigm. We need to go a step further by approximating the degree of association or causality. Hence, the positivist or post-positivist view could serve as a philosophical underpinning in this area of research. Such approximations could provide useful policy implications. Moreover, research related to the determinants of institutional quality is increasing using statistical methods, although there is no cohesiveness in terms of models underpinned by institutional theories that could be estimated. The issue of endogeneity further makes it difficult to model and estimate the determinants of institutional quality.

Nonetheless, several papers used the least square method of estimation without a direct link to model and institutional theory (Straub, 2000; Acemoglu et al, 2001; Islam and Montenegro, 2002; Borner et al, 2004, Siba, 2008 and Alonso et al, 2013). The least square method has been justified by the use of instruments as proxies where they are assumed uncorrelated with the error term. However, Albouy (2012) has criticized the method used to compute the instruments as poor and lacks strong estimation power. Furthermore, Straub (2000) and Chang (2010) argued that the main challenge in assessing determinants of institutional quality within the positivist paradigm is the lack of models underpinned by theory (Straub, 2000 and Chang, 2010). This thesis argues that models could be underpinned by institutional theories that could be estimated in the context of RTAs if certain assumptions and justifications are made about the direction of causality.

2.3.1 Rationale for modeling

The economic study into the determinants of institutional quality should consider identifying appropriate models. This can be challenging given the complex nature of institutions (Kaufmann et al, 10). Additionally, the challenges relate to whether the determinants of institutional quality can be statistically modeled in a single or multiple of equations; or whether a descriptive examination is more appropriate. Indeed, Hodgson (1998) highlighted that the introduction of mathematical economics has made research related to institutional economics redundant since its complexities are difficult to capture in a single mathematical equation. Therefore, there is no consensus on the appropriate approach to modeling the determinants of institutional quality.

The descriptive approach could be used, and it could generate an ontological[4] understanding of the nature of relationships between institutions and other factors. However, other papers argue that the descriptive approach should be treated as the first step toward a statistical approach that can epistemologically[5] capture the degree to which such relationship exists (Straub, 2000; Acemoglu et al, 2001; Maseland, 2010 and Alonso et al, 2013).

Modeling basically involves trying to identify an appropriate set of relationships between two or more variables and the nature and direction of that relationship (Gilchrist, 2000 and Heij et al, 2004). Two approaches are generally used to specify a model namely;

1. The conceptual approach which uses past information or theoretical underpinning to derive the model and

2. The empirical approach that focuses on gathering data, plot it and then derive the model by observing the nature of the relationship. Hence, the empirical approach does require extensive repeated research in order to determine the robustness of the model.

Heij et al (2004) argued that economic theory has not been able to explicitly suggest an appropriate model for use in estimation due to the abstract nature of economic theory. This is even more so in modeling the conjunction of factors that determine the quality of the institutions given its lack of

[4] Ontology- what constitute reality and how we understand existence
[5] Epistemologically- what constitute real knowledge and how do we obtain that real knowledge

theoretical cohesiveness (Borner et al, 2004; Chang, 2010 and Castellano et al, 2012). This suggests that the empirical approach to modeling might be the most appropriate given the lack of theoretical cohesiveness in the conceptual approach. Existing research has generally used both or the combinations of the two with no clear justification.

Indeed, the empirical approach has been used in several research papers (Koremenos et al, 2001; Bloch and Tang, 2004; Moss et al, 2006; Aoki, 2007; Musole, 2009; Keane et al, 2010 and Rothstein et al, 2010). Most of these papers attempt to explain the determinants of institutional quality from a utility maximization point of view. They found that differences in the quality of institutions across countries emanate from imposing resource constraints (Subramanian and Matthijs, 2007; Rodrik, 2007; and Furubotn and Richter, 2010 and Stefanadis, 2010). Hence, models in the empirical approach are usually descriptive or derived, without any direct link to estimation methods mainly due to endogeneity issues (Chang, 2010). Moreover, the empirical approach has the advantage to identify more variables and information about the nature of relationships.

The conceptual approach has also been used in several research papers (Ben-David, 1996; La Porta, 1999; Straub, 2000; Rijckeghem et al, 2001; Islam et al, 2002; Brunetti et al, 2003; Borner et al, 2004; Rodrik et al, 2004; Acemoglu et al, 2005; Zhang, 2006; Mocan, 2008; Herger et al, 2008; Levechenko, 2012; Berggren et al, 2013 and Alonso et al, 2013). Nonetheless, the link between institutional theories and models has been deficient. The lack of a clear theoretical underpinning within the conceptual approach is mainly due to the issue of endogeneity (Straub, 2000; Rodrik et al, 2004; Herger et al, 2008 and Alonso et al, 2013). Chang (2010) argued that the link between institutional theory and estimation methods usually collapse in the modeling stage mainly due to the difficulty in identifying all the mechanism about how institutions work. This thesis argues that the post-positivist paradigm can offer a solution to this issue since it assumes that quantitative research attempt to approximate or reject a hypothesis rather than establish a fact. It cautions that social science phenomenon is subjective (Creswell, 2009). Almost all the conceptual approaches used instrumental variables, including lag or initial values to estimate the determinants of institutional quality with the assumption that the instruments are uncorrelated with the error term. The use of lag as proxies is particularly interesting because it could motivate the use of autoregressive models underpinned by theory, if certain assumptions are made in the context of RTAs. Moreover, these instruments could be used as real variables in the context of RTAs if some assumptions are made about the direction of causality.

Ullman and Bentler (2012) argued that the prevalence of endogeneity can be modeled as a bidirectional relationship using structural equation models (SEM). Rodrik et al (2004) and Herger et al, 2008) have used the SEM to estimate the determinants of institutional quality. However, some parameters from SEM estimates cannot be retrieved. Hence, SEM modelers eventually use 2SLS, where some of the variables assumed to be endogenous, are instrumented or lagged. Thus, the link between theory, models and the 2SLS has not been made clear. Similarly, the solution to both SEM and 2SLS models is the same where instrumental variables are used (Wooldridge, 2013).

Therefore, both the conceptual and the empirical approaches have shortcomings which have contributed to the lack of interest among researchers about the determinants of institutional quality (Borner et al, 2004; Chang, 2010; Vogit, 2013 and Alonso et al, 2013). Our discussion in chapter five and six is to attempt to link theory, model and estimation method in the context of RTAs. We assume that our proposition would minimize endogeneity.

Furthermore, the thesis will also look at the process of convergence of institutions within the ECOWAS region because regional institutions should set common rules (Fafchamps, 2004 and Lejarraga and Shepherd, 2013). Models within trade and growth theories have been developed to look into the convergence of price and income for trade partners (Linder, 1961; Ben-David, 1996; Zhang, 2006 and Ghazaleh, 2013). The assumption is that similarities in demand preferences lead to greater bilateral trade and eventual factor price equalization since producers will adjust their prices to match the demand preferences of consumers (Linder, 1961; Quah, 1993 and Zhang, 2006). Findings from such theoretical assumptions have been mixed (Zhang, 2006). Autoregressive models are generally used in the papers looking at convergence. We argue that this approach could be extended to test the convergence of regional trade institutions.

In summary, empirical research related to the determinants of institutional quality lack clear models underpinned by institutional theory due to the issue of endogeneity and the complex behavior of institutions. We assert in this thesis that it is feasible to link model with the theory, if certain assumptions are made about the direction of causality in the context of RTAs.

2.3.2 Estimation method approaches

As we highlighted in section 2.2.0, research related to the determinants of institutional quality used either the qualitative method (North, 1990; Hodgson, 1998; 2006; De Groot et al, 2003; Bloch and Tang, 2004; Rodrik, 2007 and Castellano et al, 2012) or the quantitative method. The quantitative method mainly uses the method of least squares (OLS) and correlation test for estimation (Straub, 2000; Rose, 2005; Lee and Park, 2007; Turkson, 2012; Javed, 2013 and Salvatici, 2013). However, the assumptions of OLS do not always hold in regression equations due to the problem of endogeneity and multicollinearity that could potentially make estimates bias and inconsistent. These problems could occur in the various methods of least squares including the Generalized Least Square (GLS); Weighted Least Square (WLS) or Two-Stage-Least Square (2SLS) (Triesman, 2000; Staub, 2000; Brunetti et al, 2003; Borner et al, 2004 and Alonso et al, 2013). Other methods that have been used less extensively are the probability and autoregressive models. The autoregressive models are mainly used to test convergence while the probability models take the form of dummy dependent variable (Lejarraga and Shepherd, 2013). Hence, there is need to review these methods in order to justify our own approach.

The premise is to ascertain the extent to which the quantitative or qualitative approach could be used to answer the research questions set out in this thesis. Creswell (2009) and Silverman (2013) argue that there is no simple distinction between quantitative and qualitative method mainly because they can be complementary. In addition, it is impossible to establish which method is wrong or right; instead, we should justify the method the researcher intends to use (Creswell, 2009 and Maseland, 2011). The qualitative approach assumes that a universal theory is impossible for institutional behavior could be country or region specific (Chang, 2010). Moreover, it is impossible to vividly quantify institutions. Hence, the ideal way to describe the determinants of institutional quality is to identify patterns which give an indication of the nature of relationship without making any quantitative inference (Koremenos et al, 2001; Rodrik, 2007; Chang, 2010 and Vogit, 2013). In contrast, the quantitative approach generally assumes the existence of a universal theory or hypothesis that could capture the relationship between institutions and other variables such as trade (Chang, 2011; Maseland, 2011 and Boettke and Fink, 2011).

The qualitative approach does not require statistical models and asserts that the complex nature of institutions requires describing the nature of the relationship. The quantitative approach is being used, but it lacks clear models underpinned by institutional theory due to endogeneity issues. However, as we highlighted earlier, we should treat the qualitative approach as a first step. We argue in this thesis that a quantitative approach could be applied when the theoretical underpinnings are justified and if certain assumptions are fulfilled. For example, since regional trade institutions could not exist prior to the formation of an RTA, it is plausible to assume that interaction of countries determines the quality of regional trade institutions first. In this way, we could model this phenomenon underpinned by the institutional theories that could be universally applied in the context of RTAs. Before we get into estimating determinants of institutional quality, we will first examine the development and evolution of regional trade institutions in West Africa in the next chapter in order to know what has remained of them.

CHAPTER THREE
Examine the history of West Africa and its relations to the development of its regional trade institutions

3.0 Introduction and background

The aim of this chapter is to examine the historical changes that took place in the development and standardization of regional trade institutions in West Africa. This will enable us to understand how the present quality of institutions came about and to reflect on historical good practices for the ECOWAS deep integration scheme. The path dependency theory supports the proposition that history contributes to the current development and quality of institutions in a country or region (Acemoglu et al, 2001; 2005; Nunn, 2007 and Austin, 2008). Institutional theories also argue that the quality of institutions emanates from societal norms and interactions and the need for certainty in all forms of exchanges (Powelson, 1972; North, 1991; Englebert, 2000; Fafchamps, 2004; Hodgson, 2006; Furubotn and Richter, 2010 and Chang, 2011). Therefore, history can help to explain current institutions in Africa or at least provide us with some information about the historical changes that took place. However, Jerven (2011) argued that it doesn't make sense to attribute Africa's poor growth performance to initial conditions because there has been ample time to adjust past deficiencies. Nonetheless, Acemoglu et al (2001) identified a historical link between European settlements in former colonies and variation in the quality of their institutions. Their research highlights that colonies where Europeans settled tend to have better institutions because Europeans did not create extractive institutions. Such claims are supported by Hillbom (2014), who noted that British colonies in the southern part of Africa received grants under the colonial development fund in order to stimulate investment and institutional development.

Nevertheless, these analyses suggest that the level of underdevelopment in Sub-Saharan Africa (SSA) and West Africa can be attributed in part to weak pre-colonial and extractive colonial institutions (Rodney, 1981; Acemoglu et al, 2001; Nunn, 2007 and Richards and Nwanna, 2010). Indeed, Boettke and Fink (2011) argued that the quality of institutions determines the extent to which society engages in productive activities, hence weak and extractive institutions lead to low economic productivity, including trade flows. However, most of the research about regional trade institutions and harmonization in West Africa is skewed toward two areas. The first focuses on how the trans-Atlantic slave trade and colonial era trade favored external relations, which implies that less emphasis was put on developing infrastructure and institutions that promoted regional trade (Rodney, 1981; Davidson, 1985; Acemoglu et al, 2001; Aryeetey, 2001; Nunn, 2007; Nunn, 2008; Richards and Nwanna, 2010; Frankema and Waijenburg, 2012; Keyser, 2012; Sousa, 2012 and Hillbom, 2014). Related studies also looked at commodity trading in the trans-Saharan trade during the Empires of the Western Sudan (Barry, 1998; Thornton, 1999; Lydon, 2009 and Conrad, 2010). Hence, there was a structural shift in the development of institutions in West Africa during the colonial era which continued until today (Nunn, 2008). The second research area focuses on the feasibility of a monetary union and the implications of the merger of the WAMZ with WAEMU within ECOWAS (Debrun et al, 2005; Fielding and Shields, 2005; Tsangarides and Qureshi, 2008; Daboh, 2010; Adamu and Itsede, 2010 and Alagidede et al, 2012). Although international trade and monetary union are desirable, weakness and variation in regional trade institutions have been found to levy high costs to ECOWAS cross-border trade (ATPC Briefing, 2010; Keyser, 2012; Cissokho et al, 2012; Diop, 2012 and Sy, 2014).

This chapter argues that the current literature relating to ECOWAS lacks a holistic view of the development and harmonization of regional trade institutions in the pre-colonial and colonial era and pays insufficient attention to the history that could enable us to know how the present came about. Therefore, this chapter contributes to our understanding of the historical changes about the development and standardization of regional trade institutions from a historical perspective which is lacking in the existing literature. We argue that the historical reflection could be relevant in facilitating trade in West Africa today conditional on further investigation into how lessons could be drawn from historical good practices. Hence, it could address some recurrent challenges with ECOWAS cross-border trade that is associated with the weak regional trade institutions. Furthermore, it can also give confidence to ECOWAS members that economic and political union is feasible given that it existed in the region. The chapter also enables the reader to identify what has remained of regional trade institutions in West Africa.

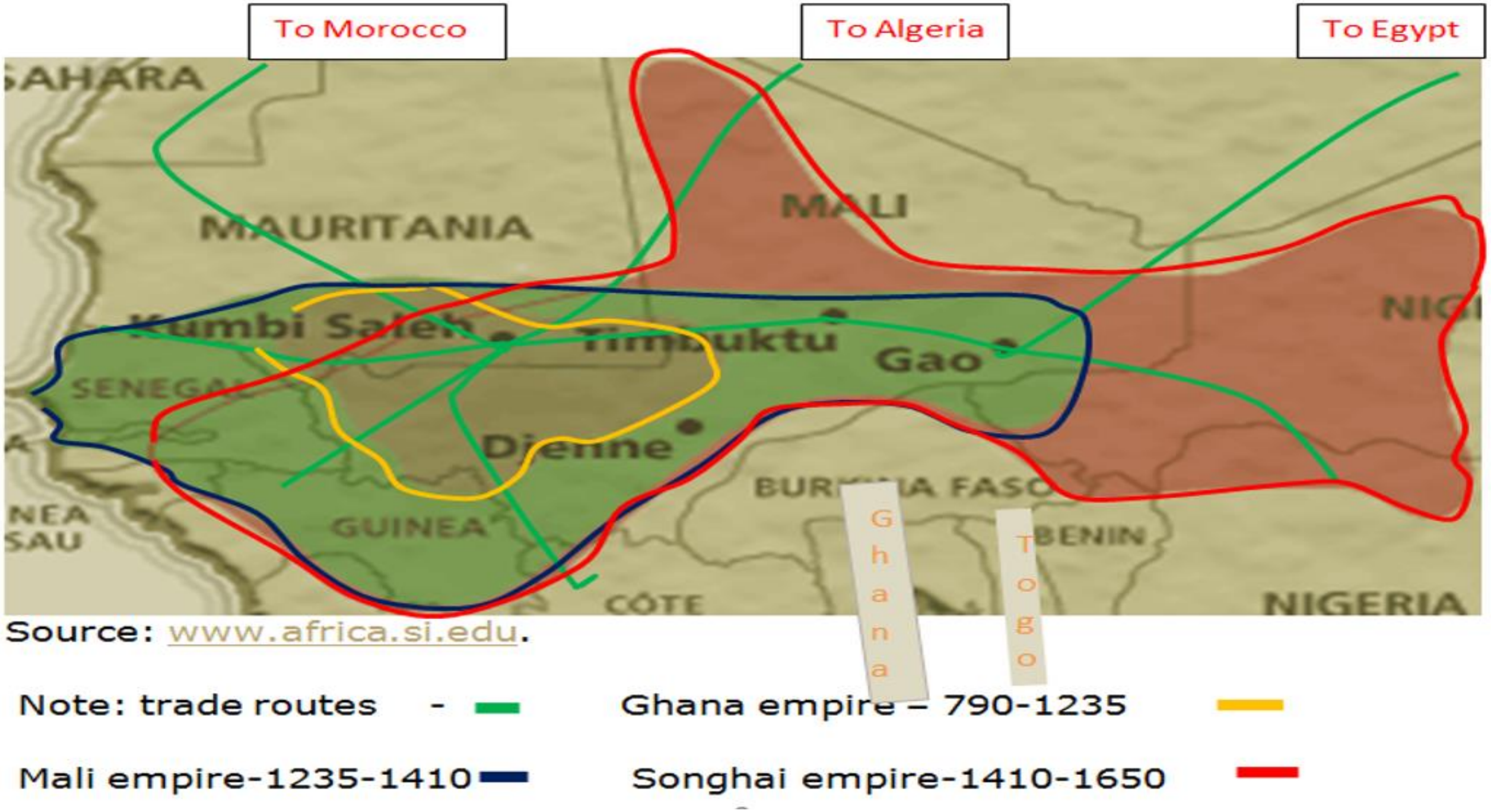
The history of regional trade institutions in West Africa can be divided into three periods, namely; the Empirehood (790 to 1650 AD), the Atlantic slave trade and colonialism (1650 to 1960s) and the post- independence and subsequent formation of ECOWAS from 1975 onwards. Each of these periods played an important role in shaping trade patterns, the rules and behavior of West Africans as well as state building (Bovill, 1933; Davidson, 1985 and Conrad, 2010). Furthermore, the issue of weak pre-colonial institutions in the Empires of Western Sudan is controversial. These Empires developed regional trade institutions, including protection of trade routes, enforcement of trade agreements and common currencies (Polanyi et al, 1975; Rodney, 1981 Davidson, 1985; Thornton, 1998; Stiansen and Guyer, 1999; Green, 2011 and Hopkins, 2014). Furthermore, institutions such as a common currency, single administration and enforcement of contracts through the chiefs, existed in the colonial era. Historical changes in governance led to the loss of some facets of regional trade institutions in post-independence West Africa. Therefore, there is a need to examine regional trade institutions in West Africa given its historical past.

The structure of the chapter is as follows. We will first discuss the trade institutions in West Africa during the Empires of Western Sudan in section 3.1. An assessment of trade institutions during the colonial era follows in section 3.2. Section 3.3 investigates the institutional structures of ECOWAS and the extent to which they could promote the harmonization of regional trade institutions. Section 3.4 summarize and concludes the chapter.

3.1 The Empirehood period (790 to 1650 AD)

The aim of this section is to investigate the evolution of regional trade institutions in the Empires of Western Sudan which has not been done sufficiently. This will enable us to determine their relative difference to the colonial era and today. The study of regional trade institutions in the Empires of Western Sudan and the colonial era has not been investigated sufficiently in terms of their evolution and the extent to which they were standardized. Our discussion here aims to fill this gap. Trade institutions are defined as rules and systems which govern and facilitate a trade such as a common currency, enforcement of contracts, common trade taxes, protection of trade from corruption and the administrative system (North, 1991). These institutions were of importance during the Empires of Western Sudan and the subsequent colonial era and have been discussed in a number of papers (Davidson, 1985; Nunn, 2007; Waines, 2010; Conrad, 2010 and Hopkins, 2014). Their heritage continues to be important in facilitating trade across the world today. Western Sudan consisted of three major Empires beginning around 790 to 1650AD; the Ghana, Mali and Songhai Empires respectively (Conrad, 2010). Figure 3.1 provides a rough description of the location of these Empires in West Africa and their main trade routes.

Figure 3.1 Map of West Africa showing the location of the Empires of Western Sudan and their associated trade routes



These Empires covered most of the present-day ECOWAS member states and to some extent defined the precolonial history of West Africa (Adomakoh, 1962; Munson, 1980; Catchpole et al, 1983; and Barry, 1998; Silberman et al, 2012 and Ikpo, 2015). Each of these Empires was composed of kingdoms or provinces with their own specialized mode of production, which provided the inevitable need for exchange, despite the existence of subsistence farming (Rotberg, 1965; Davidson, 1985; Shillington, 1995; Conrad, 2010 and Cinyabuguma and Putterman, 2010). The exchanges require the functionality of rules and regulations as well as distribution channels. As such, trade routes were created, which stretched from the Atlantic coast of present-day Mauritania, The Gambia and Senegal (Tekrur Empire) to Hausa land in Nigeria, southwards to present day Guinea and Ivory Coast in addition to the trans-Saharan trade routes that stretched to present-day Morocco, Algeria, Libya and Egypt (Davidson, 1985). Additional routes, such as rivers, linked villages, and towns (Lugard, 1964 and Meagher, 1997; Thornton, 1998; Conrad, 2010 and Hopkins, 2014). Furthermore, the Empires established rules and regulations that governed regional and international trade (Conrad, 2010 and Hopkins, 2014).

These Empires were also called successor Empires because they emerged from one another (Levtzion, 1971). These successions provided evolution toward standardization of regional trade institutions as new Empires inherited and improved the previous systems. For example, the Mali Empire adopted the import and export taxes from Ghana while also absorbing Ghana (Munson, 1980 and Davidson, 1985). Hence, there was a gradual move towards common trade taxes as the Empires enlarged. Furthermore, the kings in the Mali Empire recognized that, in order to promote trade, there must be security and certainty in trade transactions (Conrad, 2010). As a first step, the Mali Empire made peace with other kingdoms through consensus (Davidson, 1985; Levitt, 2015; Asante and Leadbitter Jr, 2016). The ‘Mande charter’ was of importance in the evolution of common institutions in the Mali Empire and in subsequent Empires (Levitt, 2015; Asante and Leadbitter Jr, 2016). The ‘Mande charter’, brought clans and small kingdoms together in order to codify how they should be governed (Levitt, 2015; Asante and Leadbitter Jr, 2016). Since clans and kingdoms existed mainly on an ethnic basis at the time, the expansion of Empires arose from consensus, trust and cooperation, although warfare was also used to annex in some places (Conrad, 2010). The clans and small kingdoms agreed to be ruled by one king in order to maintain overall peace, to protect trade routes and to harmonize trade rules. Ibn Battuta and Al-Bakri cited by Davidson (1985) and Waines (2010) suggested that the harmony of trade rules in different parts of the Empires provided security and certainty for traders. Furthermore, Ahmad Ibn al-Yaqubi cited by Conrad (2010) narrated that the kings had smaller kings under their authority which point to the likelihood of common rules governing the Empires. Ibn Kathir also narrated that 'Mansa Musa' had an estimated 24 kings under his authority. Conrad (2010) argued that the strength of the Empires was based on the control of regional and international trade which suggests the unlikelihood of the divergence of regional trade institutions. Nunn (2007) and Hopkins (2014) argued that the expansion of trade led to large towns and the formation of states (Empires), gradually leading to an economic unity of West Africa. These sources suggest that regional trade institutions were gradually standardized as Empires enlarged. This was likely from an economic point of view since the divergence of trade institutions in the same town or Empire would have pushed traders to markets with more efficient institutions. In their absence, places with less efficient trade institutions would have adjusted in order to remain competitive. Furthermore, a number of papers highlighted that small kingdom were annexed by larger kingdoms in the process of forming these Empires (Conrad, 2010). Hence, the divergence of regional trade institutions would have been unlikely in these Empires since annexed kingdoms were likely to comply with their conquerors (Barry, 1998; Conrad, 2010).

The historical changes toward standardized regional trade institutions should be expected since these Empires were significant trading entities that derived their strength from the exchange of many commodities such as gold and salt (Polanyi et al, 1957; Rodney, 1981; Davidson, 1985; Reece, 2005 and Waines, 2010). Other goods traded within West Africa included textiles, kola nuts, ivory, copper, food and live animals (Johnson, 1970; Lovejoy, 1974; Munson, 1980; Conrad, 2010 and Hopkins, 2014). Although, the trading quantities were unknown, there is evidence that intra-West African trade was extensive, where cowrie shells, gold, copper, manillas and cloth acted as common currencies to facilitate trade in the region (Adomakoh, 1962; Johnson, 1970; McPhee, 1971; Lovejoy, 1974; Austen, 1987; Manning, 1988; Naanen, 1993; Ogundiran, 2000; Nawaz, 2001; Nunn, 2007; Lydon, 2009; Odunbaku, 2012 and Hopkins, 2014).

The evolution of these Empires and the security for traders suggested the presence of standardized trade rules and regulations such as a system to protect trade routes through the army and royal officials, courts to settle trade disputes, banking and letters of credit to ease payments, common currencies and common trade taxes were all established to facilitate and protect trade (Bovill, 1933; Polanyi et al, 1957; Johnson, 1970; Levtzion, 1971; Munson, 1980; Rodney, 1981; Reece, 2005 and Waines, 2010). These trade institutions were of particular importance in the Empires and their practices could be relevant in facilitating trade in West Africa today. Furthermore, reflecting on these regional trade institutions could address some of the recurrent institutional failures which add to trade costs within ECOWAS today. For example, the trade, customs and free movement of persons (TACFEMP) as well as the legal and judicial affairs committee are important sub-committees of the ECOWAS parliament. In addition to other duties, the TACFEMP committee is responsible for developing legal rules regarding the establishment of the economic and monetary union (article 55 of the 1993 revised treaty), which was scheduled for 2008. Furthermore, the committee considers the regulation of customs procedures, payments and other trade-related rules as stipulated in Chapter VIII, as well as supporting the coordination of the judiciaries on trade-related disputes (ECOWAS Parliament, 2014). In the Empirehood, the King had representatives in each kingdom whose role was to monitor rules and regulations (Polanyi et al, 1957; Davidson, 1985, Reece, 2005 and Hopkins, 2014).

A number of papers highlighted the presence of common currencies during the Empires of Western Sudan such as cowrie shells, copper and manillas, cloth, gold and iron rods (Hopkins, 2014; Johnson, 1970 and Naanen, 1993). For example, the Ghana King levied one Dinar of Gold mithqal for each donkey loaded full of goods entering the Empire and two Dinars for leaving the Empire, regardless of point of entry or exit (Davidson, 1985 and Conrad, 2010). Such levies are equivalent to import and export tariffs in modern international trade language. It suggests that gold mithqal acted as a common currency and common trade taxes in the Ghana Empire. If other currencies existed at the same time, it was likely that they were convertible. Indeed, Conrad (2010) argued that as early as the 13th century, West Africans preferred cowries as a medium of exchange. This argument is corroborated by a number of papers. Johnson (1970) narrated that gold and cowries were the most commonly used currencies in West Africa. Hopkins (2014) noted that cowries were used extensively, and other currencies were used only where cowries could not penetrate. Furthermore, Ogundiran (2000) and Odunbaku (2012) also highlighted that the cowrie shells were used in all West African states in the pre-colonial and colonial era. Corroboration of the extensive level of intra-West African trade with the extensive use of cowries suggests that they acted as a common currency or at least were convertible to other currencies. Hence, cowries evolved to replace other media of exchange as the Empires expanded. The cowrie was fixed in value against other goods and currencies outside West Africa in order to generate certainty of wealth value (Johnson, 1970 and Hopkins, 2014). Therefore, the extensive use of cowries as a medium of exchange shows that it was accepted as a common currency and was convertible with other lesser used currencies. In contrast, ECOWAS is characterized by eight currencies which are not directly convertible (Sy, 2014). This shows the extent to which the Empires had a more standardized currency management system than the current situation in ECOWAS.

The evolution in the enforcement of contracts during the Empires of Western Sudan suggests that they were gradually standardized. This is corroborated by several events. First, the existing literature suggests that intra-West

African trade was extensive (Thornton, 1998; Stiansen and Guyer, 1999 and Hopkins, 2014). Secondly, Conrad (2010) narrated that ‘Mansa Musa’ had about 24 minor kings under his control during the Mali Empire. Since the Songhai Empire was larger, it was likely that more minor kings were under the authority of one king. Third, there were royal courts in each province assigned to settle all kinds of disputes including trade (Waines, 2010). Fourth, Waines (2010) highlighted the presence of interlocutors between parties engaged in trade and in royal courts as witnesses in the Mali Empire. For example, Ibn Battuta cited in Waines (2010) bought a slave girl for 25 gold mithqals but the owner later wanted to revoke the deal. However, the interlocutor was consulted which resulted in Ibn Battuta being compensated with another slave girl. Fifth, the provinces had representatives in the Empires, while the kings also sent representatives to these areas, where their role was to convey and monitor any agreements. These events suggest that the provinces benefitted from trade to the extent that they agreed to be ruled by a central authority that would harmonize trade and maintain overall peace (Davidson, 1985). This reinforces our earlier discussion, that it is unlikely that there were divergent contract enforcement rules in the Empires. These representatives and interlocutors ensured that contracts were enforced. ECOWAS could reflect on its historical past regarding the enforcement of contracts during the Empirehood era.

The Empires of Western Sudan also protected trade routes from corruption through the royal armies. As trade expanded in the early days of the Empires of Western Sudan, there were reports of caravans being attacked along the trade routes in some parts of the empires (Davidson, 1985; Barry, 1998 and Conrad, 2010). As a result, royal armies were assigned to patrol trade routes in order to protect them. Again, the earliest narrations by Ibn Battuta suggest that there was security in the Empires for traders. Trade taxes were used to fund the royal armies’ patrols (Conrad, 2010). Hence, the leaders in these Empires were pragmatic in resolving issues which hindered trade flows. This was made easy by a commitment to be governed by a central authority.

This type of political commitment, whereby countries form a federation or similar, is needed in the context of ECOWAS in order to achieve deeper economic integration. Furthermore, the Western Sudan era highlights a number of observations regarding the determinants of institutional quality such as the need to maintain peace as a requirement to expand trade as well as the certainty of trade rules. Al-Bakri cited by Davidson (1985) and Conrad (2010) about the harmony of trade rules in different parts of the Empires provides interesting evidence. Ibn Battuta further described that lost goods would be returned, which epitomized the effectiveness of these trade institutions since the implications for non-compliance were clearly defined which included being exiled (Waines, 2010). Royal courts were usually attended by large crowds during which citizens submitted complaints and legal disputes and judgments were made openly, which was culturally humiliating (Conrad, 2010). According to Ibn Battuta, the compliance rates across these Empires were high because the social and cultural norms valued sincerity and integrity in all forms of interactions (Waines, 2010). Societal norms determine the extent to which institutional rules are adhered to, where existing empirical findings have supported their importance in determining institutional quality (North, 1991; Rodrik and Subramanian, 2004; Rodrik, 2007 and Alonso and Garcimartin, 2013). In the context of ECOWAS, trade institutions would be expected to emanate from societal norms.

This analysis explains that regional trade institutions in the Empires of Western Sudan were developed and standardized relative to the current situation in West Africa. Societal norms such as the Mande charter provided trust that ultimately led to cooperation and the ability to trade. This has been corroborated by commentaries from Al-Bakri and Ibn Battuta’s narratives about the efficiency of trade in the Empires (Thornton, 1998; Stiansen and Guyer, 1999; Conrad, 2010 and Hopkins, 2014). This was not surprising because the Empires grew out of the trade. Hence, it was likely that more resources were allocated to improving trade institutions. Institutions that facilitated a trade such as the common currency, standardized trade rules such as common trade taxes, protection of trade routes through the royal armies and dispute settlements through royal courts were arguably more standardized and efficient than the current trade institutions in the ECOWAS region. In order to achieve regional development through regional integration and trade, strong institutions must set common rules (Omorogbe, 1993; Englebert, 2000; Aryeetey, 2001 and Assane et al, 2014). As such, ECOWAS can learn lessons from the Empirehood period, in terms of improving the quality of regional trade institutions as a prerequisite to successful regional integration and facilitation of trade.

However, the last major Empire in West Africa, Songhai, collapsed around 1650, creating a power vacuum and internal conflicts that resulted in inward-looking kingdoms. This marked another turning point in the development of trade institutions in West Africa. The review of the literature suggests that we could depart from the current conventional assertion that colonialism directly interrupted the natural development of institutions in SSA. We argue that such claims are debatable with regard to regional trade institutions since internal conflicts led to antagonism and lack of cooperation among kingdoms that had existed before the Atlantic slave trade and colonial rule and acted as a vacuum that was exploited by European traders and colonialist. What we can establish is that regional trade institutions evolved to be standardized before the Songhai Empire collapsed. Furthermore, the colonial era also created some regional trade institutions that shall be discussed in the next section.

3.2 The Atlantic slave trade and colonialism (1650 to 1960s)

In the previous section, we established that the Empires of Western Sudan evolved to standardize regional trade institutions. Nonetheless, the collapse of the Songhai Empire led to inward looking kingdoms which in part, weakened the process of regional integration. This period marked the beginning of the Atlantic slave trade and later colonialism. Therefore, the aim of this section is to examine the extent to which resemblance of standardized regional trade institutions in the past existed during this period.

The Atlantic slave trade and subsequent colonialism also played an important role in defining the history of West Africa and SSA today (Heldring and Robinson, 2013 and Hillbom, 2014). The conventional wisdom in the existing literature is that the slave trade and colonialism directly interrupted the natural development of institutions in SSA and in part contributed to its current underdevelopment (Rodney, 1981; Acemoglu et al, 2001; Nunn, 2008 and Heldring and Robinson, 2013). However, we argue that the slave trade and colonial era did encompass some institutions which could have been vital in promoting regional trade today such as common currencies, single administration, contract enforcement through the chiefs and a common education system, although they may not have been specifically intended to do so.

The colonial era saw a shift from local administrative systems to the adoption of international administrative systems, while British colonies also experienced indirect rule. Furthermore, the importance of various trade routes changed. During the Empirehood, Europeans and Asians particularly benefitted from the trans-Saharan trade since there was limited sea travel to the West African coast. For example, significant proportions of the gold that Europeans used to make coins originated from West Africa via the trans-Saharan trade routes (Lydon, 2009 and International Slavery Museum, 2015). However, expansion of sea travel brought West Africans into more contact with European traders along the coast partly contributing to the decline of the trans-Saharan trade (Barry, 1998; Thornton, 1998; Austen, 2010; Conrad, 2010 and Lovejoy, 2012).

Hitherto it was North Africans who were the middlemen. However, occasional internal conflicts within West Africa meant that Europeans could not trade securely, and they gradually began to accompany their vessels with armies. This is corroborated by Milgrom et al (1990) and Grief (1992) who argue that during the 13^{th} to 16^{th}-century European merchants demanded that their governments should help to protect international trade routes. In the previous section, we highlighted the possibility that the standardized regional trade institutions may not have continued after the collapse of the Songhai Empire. This view assumes that internal power conflicts in West Africa partly broke the Songhai Empire and led to smaller inward-looking kingdoms. However, this claim has been contested by Johnson (1970); Davidson (1985); Nunn (2008) and Nunn and Wantchekon (2011).

The extension of European trade with the Americas and the need for productive workers in the plantations partly led to the trans-Atlantic slave trade (Austin, 2008). There are conflicting estimates as to the number of slaves that were transported across the Atlantic Ocean. The focus of this section is to highlight that West African contacts with Europeans initially began with trade in goods and humans then subsequently led to a colonial rule, which shaped institutions in the region (Acemoglu et al, 2001 and Heldring and Robinson, 2013). Rodney (1981), Kingsley (1899); Nunn (2008) and Nunn and Wantchekon (2011) are of the view that the slave trade and colonialism interrupted institutional development in West Africa. They assert that it created antagonism among communities that had hitherto lived together peacefully due to their trade links. However, there were internal conflicts in the Songhai Empire, which contributed to its collapse around 1650. Therefore, although we cannot entirely dismiss the claim that colonialism might have aggravated any future attempt to unite West Africa under an Empire, it is debatable that the institutional development experienced during the Empirehood would have continued. What can be established is that the regional trade institutions during the Empirehood were more standardized and effective relative to the current regional trade institutions in West Africa, mainly because the Empires were ruled akin to a federal administration especially after the ‘Mande charter’ (Levitt, 2015; Asante and Leadbitter Jr, 2016).

Furthermore, institutions existed during the slave trade that continued during colonialism such as the use of cowries as a medium of exchange, single administration and the use of chiefs to enforce contracts (Polanyi et al, 1957 and Apoh, 2008). For example, Europeans vessels set out from their ports to the West African coast where they exchanged goods for slaves. These slaves were later transported to the Americas where they farmed goods such as sugar, coffee, tobacco, rice and later cotton, which were then transported to Europe. There is a consensus in the existing literature that the European traders cooperated with agents and kingdoms in West Africa that facilitated the slave trade (Polanyi et al, 1957; Barry, 1998; Green, 2011 and Lovejoy, 2012). The structure of these agents' transactions has not been fully researched. However, Polanyi et al (1957) and Green (2011) argued that small kingdoms had security agreements where they paid each other customs duties in return for easy passage of captured slaves, which was synonymous to common rules that protected trade routes. We argue that these agreements and cooperation may be considered as a mechanism to harmonize trading rules and regulations in West Africa although these rules were geared towards an inhumane international trade rather than intra-kingdom trade in goods.

However, lessons can be drawn from these events. For example, the harmonization of trade institutions at the regional level requires funding to function effectively. During the Empirehood and slave trade, these rules were enforced by royal armies and funded from customs duties and production taxes (Polanyi et al, 1957 and Davidson, 1985). Therefore, allocating a percentage of trade taxes specifically for the ECOWAS trade facilitation scheme is one method of funding and maintaining the effectiveness of some regional trade institutions. In addition, the cooperation of some kingdoms for easy passage of slaves indicated the presence of rules governing such inhumane trade. Reneging on arrangements resulted in a war between kingdoms. For example, the kingdom of Dahomey and Whydah cooperated in the transport of slaves by protecting routes in exchange for payment of customs duties. However, Dahomey seized Whydah in 1727 in order to take full control of trade routes after Whydah refused to pay duties to Dahomey (Polanyi et al, 1957).

Therefore, we wish to assert that West Africans have to some extent a history of cooperating in the establishment of trade institutions, which could be modified to facilitate the goods trade in the current era. The incentives for such cooperation were financial. As a result, the harmonization of regional trade institutions in ECOWAS today could depend on the extent to which gains are perceived by member states. Such gains are likely to emanate from the level of trade flows. An increase in trade flows will partly require the protection of traders from uncertainty and corruption such as bribe payments at border controls and illegal checkpoints which add to trade costs (Cissokho et al, 2012). It will also require enforcement of the ECOWAS customs union arrangements by punishing perpetuators through the courts.

As the slave trade gradually faded, Europeans began to colonize the region. The advent of colonialism had two facets in terms of the development of trade institutions. The first was the domestic administration system that included regional trade rules in the commercialization of commodity trade (Adomakoh, 1962; Stiansen and Guyer, 1999 and Hopkins, 2014), and the second was the administration of international trade. According to Richards et al (2010) and Hopkins (2014) Europeans were interested in two-way trade between Europe and West Africa, where West Africa provided raw materials for manufactured goods. As a result, the trade facilitating institutions were mainly geared toward international trade rather than regional trade. For example, a rail line in French West Africa from Bamako to Dakar linked the interior to the coastal area in order to transport raw materials to the ports of Senegal which reduced transport costs (Austen, 2010 and Hopkins, 2014). This rail line did not follow the traditional trade routes that existed previously; hence it was of little use for intra-West African trade at the time. As a result, there was little attention paid to the improvement of regional trade institutions during this period. This has built up the consensus in the existing literature that colonialism led to the production structure shifting to serve international trade rather than regional trade.

Nonetheless, during the colonial era, some institutions were created such as common currencies, single administration and education system and contract enforcement rules which could be useful in promoting trade and cultural harmony in West Africa today. Furthermore, they generated cooperation beyond national borders and partly formed the basis for the creation of WAEMU in 1994 and WAMZ in 2000 as separate organizations within ECOWAS. We are aware of the shared institutions across British and

French colonies. The four British colonies of Nigeria, The Gambia, Ghana and Sierra Leone including Liberia[6] at some point shared:

- 'The British West African Shilling (BWAS)' as a common currency under the control of the West African Currency Board (WACB), first inaugurated in 1912 (Adomakoh, 1962; Hopkins, 1970; Carland, 1990; Hopkins, 2014 and Cuhaj, 2015)[7] and,
- The West African Examination Council (WAEC).

The BWAS was directly convertible to the British pound upon request by European traders in the colonies. This was synonymous to the convertible common currencies we discussed earlier during the Empirehood. Furthermore, BWAS signaled a historical change toward a monetarized currency which was an improvement and more convenient for those engaged in international trade than the cowries used in the Empirehood and the early parts of colonialism (Hopkins, 2014 and Herbst, 2014). However, the colonial administrations and European traders did not encourage the BWAS to be used for regional trade. Its use as a medium of exchange to expand regional trade was conditional on a favourable balance of payments in the colonies (Hopkins, 1970; Hopkins, 2014 and Herbst, 2014). Therefore, the colonial currencies were intended to promote international trade rather than regional trade. On the positive side, the BWAS resulted in the removal of exchange rate costs and led to the reduction of barter exchange (Hopkins, 1970; Ogundiran, 2000; Waines, 2010; Odunbaku, 2012 and Hopkins, 2014). The colonial administrations and European traders were keen to reduce barter for goods destined to the international markets by accepting BWAS for goods purchased during the latter part of colonialism (Hopkins, 2014). Given the extent of unofficial trade in the region today (Meagher, 1997 and Golub and Mbaye, 2009), maintaining the BWAS would have eliminated exchange rate conversion costs, expanded regional trade and raised the income of traders. This is corroborated by Sy (2014) who

[6] Liberia adopted the British West African Shilling (BWAS) until 1943

[7] The WACB replaced the Bank of British West Africa which was established in 1894 by British merchants and had branches in all the British colonies including Monrovia (in Liberia) (Hopkins, 2014)

cited SWIFT[8], who stated that 50% of intra-African trade financial settlements are conducted with banks outside the continent, which adds to transaction costs and serves as a disincentive for trade and investment in the region.

It can also be argued that the BWAS and CFA Franc gradually replaced the cowrie shells, gold, cloth, an iron rods and copper as a common currency in the later part of colonialism. This was enforced by the colonial administration favoring tax and other commodity payment in colonial currency rather than in kind or cowries (Nunn, 2007). Furthermore, although colonialism was engulfed by forced labor that was mainly compensated in kind (Gupta, 1981; Fall, 2002 and Osborn, 2003); the colonial currencies were later encouraged for payment of labor and other domestic agricultural products (Fall, 2002). Fall (2002) argued that the use of the colonial currencies was intended to enable French West Africans to pay their taxes to the colonial governments and to purchase imports. This payment system continued today in the form of direct and indirect taxes. The Empirehood also had an integrated tax system as we discussed in the earlier section. Nonetheless, Johnson (1970); Ogundiran, 2000 and Odunbaku (2012) argued that the cowrie shells continued to be used as a medium of exchange during the colonial period despite the colonialists' attempt to eliminate their use. The role of WAEC is to ensure common practices in the education of the British colonies in West Africa including Liberia (Nicol, 1971). WAEC ensured cooperation through the establishment of a common education system in the British colonies which had the potential to generate common standards and cultural diffusion (Agbodeka, 2002). For example, some of the committee members that administer WAEC are nominated government of member countries while other members are nominated by school teachers and members of higher education institutions (Nicol, 1971). This could make standardization of regional trade institutions less challenging and help inform citizens about their rights under the ECOWAS trade liberalization scheme.

[8] SWIFT- Society for Worldwide Interbank Financial Telecommunication

In the French colonies, similar institutions were established. France administered its West African colonies as the Federation of French West Africa from around 1895 to 1960 when the colonies gained their independence except for Guinea in 1958 (Renninger, 1979 and Klein, 1998). The federation had a single currency (CFA)[9], common education system and single administrative system (Huillery, 2006). Some features of these institutions such as the CFA and monetary policy still exist today in the form of the WAEMU (Chafer, 2002). The maintenance of these institutions is attributed to several factors which shall be discussed later.

In the early days after independence, some institutions were created beyond colonial affiliations. It is also difficult to prevent communities from interacting in economic and social matters due to the artificial borders of the colonial legacy. To some extent, these issues and institutions formed the basis for the creation of ECOWAS. An example of such an institution was the establishment of the West African Groundnut Council (WAGC) of Senegal, The Gambia, Mali, Niger, Nigeria and Burkina Faso in 1964. This cooperation was intended to facilitate the accumulation of products, such as groundnuts, for overseas markets (Renninger, 1979 and Mays, 2015). The process of accumulating groundnuts from various parts of the region was probably facilitated by the existence of common regional trade rules and cooperation. However, little research has been conducted into how such cooperation and institutions could have been maintained and expanded in order to promote regional trade.

Apart from the WAEC, the other institutions in the British colonies were abandoned after independence. WAEC ensured greater cooperation between the former British colonies in West Africa that could have to serve as a platform for cooperation in other sectors. The former French colonies maintained the single currency and recognized the desirability of maintaining at least some of the institutions due to several factors. First, France ruled its colonies in a more rigid, centralized way with some element

[9] CFA (French colonies of Africa and later French community of Africa) and the FCFA (Franc of the French Community of Africa) were both used in the colonial period. The CFA was used until 1958 when it became FCFA. Note that the CFA was used in both France and the colonies until 1945 when a separate CFA Franc was issued for the colonies in West Africa (Hopkins, 2014).

of assimilation which made cooperation after independence desirable (Huillery, 2006 and Hopkins, 2014). A second and more recent argument suggests that France desired to maintain closer ties with its former colonies since an estimated 50% to 65% of WAEMU members' net external assets must be deposited with the French treasury while the West African CFA franc is pegged to the euro (Sene, 2014 and Koulibaly, 2014). However, enthusiasm to maintain the institutions of the colonial powers gradually eroded (Renninger, 1979). For example, Guinea opted out of the CFA and is now more aligned with the WAMZ of the English-speaking countries. Richards and Nwanna (2010) argued that the British and French created market policies and institutions that were non-integrative at the regional level, which contributed to the slow pace of regional integration. In contrast, the French wanted to maintain closer ties with their former colonies. However, as we highlighted previously, the colonial powers did create institutions that provided the platforms for cooperation. For example, these platforms have proved important as the Anglophone countries aspire to reinvent the common currency while ECOWAS intends to achieve a political union in the long run.

Furthermore, the extent to which contracts were enforced and disputes settled during colonialism was not entirely dissimilar from practices during the Empirehood. Nunn (2007) highlighted that labor contracts signed between Europeans and locals could not be broken without punishment. Furthermore, Carland (1990) highlighted that the colonial administration used local chiefs to communicate to the people. For example, the chiefs were used to communicate the value of the colonial currency to the locals and how they should avoid exploitation (Carland, 1990 and Apoh, 2008). These chiefs were synonymous to the representatives in each province during the Empirehood. Therefore, regional trade institutions during the Empirehood and colonial era were not entirely dissimilar. However, the protection of trade routes was more standardized and enforced during the Empirehood than the colonial period. For example, bandits and robbers attacked trade routes in order to loot goods during the colonial period since their influence on trade was gradually replaced by European traders

(Carland, 1990 and Conrad, 2010). In contrast, the Empirehood protected traders from bandits and robbers.

The discussion in the previous two sections shows that the common currencies evolved into two monetarized currencies in West Africa during the colonial era - the BWAS and the CFA franc, which was an improvement from the Empirehood in terms of the number of currencies. Furthermore, there was a move to make the cowries non-convertible to the colonial currencies in order to gradually replace them, while the colonial currencies were convertible with foreign currencies (Hogendorn and Johnson, 1986 and Apoh, 2001). Nonetheless, the cowries and other pre-colonial currencies were also convertible to each other during the Empirehood (Hogendorn and Johnson, 1986; Muller, 1985; Conrad, 2010 and Hopkins, 2014). While the contract enforcement system was similar in the Empirehood and colonial era, the protection of trade routes was more organized through the royal armies in the Empirehood relative to the colonial era. Furthermore, the Empirehood and colonial era had a single administration system akin to a federal system which made it easier to established common trade institutions. It shows that there was a little divergence in the standardization of some regional trade institutions during the Empirehood and colonial era. This raises the issue of what has remained of some facets of regional trade institutions in West Africa today and its implication for the ECOWAS deep integration goal?

3.3 West Africa after independence and ECOWAS in 1975 onwards

We demonstrated in the previous two sections that some standardized regional trade institutions existed in the Empirehood and colonial era. By 1975, all the 16 West African states at the time were self-governed. This marked another turning point in the evolution of regional trade institutions as nations choose self-rule rather than maintaining the administrative structures of the past. Therefore, maintaining the standardized regional trade institutions of the past would have required greater cooperation and coordination. The aim of this section is to discuss what has happened to regional trade institutions in West Africa post-independence and the extent to which the creation of ECOWAS and its associated institutions could further the development of standardized regional trade institutions. There are specific ECOWAS institutions which are of particular importance in this regard.

The history of ECOWAS has three turning points. The first is the 1975 Lagos treaty which established ECOWAS. The second is the revised 1993 treaty which shifted ECOWAS to an accelerated cooperation and integration. The third is in 2004 when ECOWAS and the West African Economic and Monetary Union (WAEMU or UEMOA) signed an agreement to coordinate and harmonize their operations in preparation for a monetary union (Daboh, 2010 and Adamu et al, 2010). Before these turning points, some events occurred in West Africa which motivated the creation of ECOWAS. We shall discuss these events first and then the turning points in detail.

3.3.0 Events leading to the creation of ECOWAS

As was discussed in chapter one, almost every country is part of one or more regional trading agreements which required the codification of common institutions in order to realize the full potential of integration (Gupta and Yang, 2007 and WTO Report, 2014). Geda et al (2007) argued that the success of RTAs depends on the growth of trade hence their formation is motivated by trade although Laird (2002) and WTO Report (2014) claim that security and other political factors are becoming increasingly important in the formation of RTAs.

West African states gained their independence between 1957 and 1974, except for Liberia, which was never colonized. Why did it take that long to form ECOWAS given that the colonies and the Empirehood were governed akin to a federal administration? A number of events could be attributed to the formation of ECOWAS in 1975. Four events are particularly important although not exclusive in the existing literature (Lavergne, 1997 and Orsini et al, 1994).

First, many leaders that led Africa to independence advocated a united Africa through Pan-Africanism in order to break away from the colonial past

(UNECA Report, 1969). However, the inward-nationalistic behavior of some countries did not help improve living standards. Renninger (1979) highlighted that most African countries assumed at the time that self-determination, and self-reliance through political and economic independence could only be achieved through self-rule. Nonetheless, given the small economic sizes of most West African states, Orsini et al (2004) and Lavergne (1997) argued that the desire for cooperation was inevitable. Furthermore, cooperation does not mean integration. Therefore, it was gradually realized that some form of integration or maintaining and strengthening some of the common institutions in the previous eras could have accelerated an integration process.

Second, the European powers that had given West African countries their independence in the 1960s also wanted to maintain ties in order to continue their access to the raw materials and to strengthen trade with their former colonies. As a result, the Lome convention was negotiated and signed on the 28th of February 1975 by 9 EU (then EEC members) and 46 developing countries including former colonies in Africa, Caribbean, and Pacific (ACP) nations (Stevens et al, 1999). This was known as the ACP-EU convention (Secretary –General Council of the European Communities). Mouradian (1998) argued that; “The first Lomé Convention, signed in 1975, arose out of Europe’s wish to guarantee itself regular supplies of raw materials and to maintain its privileged position in its overseas markets. It also derived in part from a sense of responsibility arising out of its colonial past”.

The objective of the Lome convention was to establish economic cooperation and development through trade links. The Lome agreement allows ACP nations free access to European markets without reciprocity[10]. As Mouradian (1998) further expressed, Europeans were aware that the finished products that the ACP raw materials had produced in Europe would be exported back to ACP countries since the institutional frameworks were already put in place during the colonial days. Therefore, Europe had incentives to help West Africa organize a regional body that would enable

[10] Non-reciprocity is also accepted by the WTO under the general system of preferences (GSP).

them to negotiate a unified treaty rather than with individual states. On the part of the ACP countries, regional integration was meant to reduce exploitation and increase their bargaining power to negotiate future agreements on their terms as well as to influence changes to the international economic system, which they perceived to discriminate against them (Renninger, 1979). Hence, there were mutual benefits for a regional body to be formed.

Third, many Intergovernmental groupings between countries existed in West Africa with the aim of cooperating in economic activities especially in trade and joint investment initiatives. In addition to the West African Groundnut Council mentioned earlier, other intergovernmental groupings include the Lake Chad Basin Commission of 1964 that included Nigeria, Chad, Niger and Cameroon; the Mano River Union of Guinea, Liberia and Sierra Leone of 1973; the West African Monetary Union in 1973 of Benin, Ivory Coast, Niger, Senegal, Togo and Burkina Faso (Bundu, 1997 and Iyoha, 2005); and the Economic Community of West Africa (ECWA), established on the 4th of May 1967 in Accra by 12[11] West African countries with the help of the UNECA in order to help accelerate industrialization (UN Treaty series v595. p287). However, the ECWA did not function due to a lot of political changes in the form of coups d' etats during this period in West Africa (about 20 coups in 8 countries) and the Biafra war in Nigeria (Page et al, 2001). Therefore, West African states recognized the importance of regional integration and ECOWAS was formed in 1975 with the signing of the Lagos treaty with the aim of achieving customs union status by 2000[12].

3.3.1 ECOWAS 1975 and 1993 treaty and their aims

The aim of this section is to discuss the ECOWAS treaties in order to evaluate the extent to which some associated institutions could facilitate the standardization of regional trade institutions. This is important because

[11] The 12 countries were Benin, Burkina Faso, The Gambia, Ghana, Liberia, Mali, Mauritania, Niger, Nigeria, Sierra Leone and Togo.

[12] Article 12 of the 1975 treaty mentioned 1990 for customs union. Article 35 of the 1993 treaty mentioned 2000. ECOWAS also aim to achieve an economic union in the future although no time frame given.

treaties determine the basis for the coordination of regional policies which is vital for the standardisation of regional trade institutions. The treaty that established ECOWAS came into force on the 20th of June 1975 when the required 7 signatories was met (Aryeetey, 2001). The 1993 treaty is a revised version of the 1975 treaty. Both treaties set out the aims of ECOWAS and how they are going to be achieved in stages. Article 2 in chapter 1 of the 1975 treaty stated that the aims of ECOWAS are to promote co-operation and development in all fields for the purposes of raising the standard of living of its people, maintaining economic stability and contributing to the progress and development of the African continent (United Nation Treaty Series, V1010, p.20). Article 12 of the 1975 treaty also called for the establishment of a customs union by 1990 with a common external tariff. Other aims such as the harmonization of trade, agricultural and monetary policy did not have a specific time frame and were left to the council of ministers to decide.

Interestingly, some of the institutions that ECOWAS aims to harmonize were common to a number of present-day countries during the Empirehood and colonial period. Therefore, the challenge for ECOWAS like many other RTAs is how to achieve an economic union in tandem with political unity given the successes we discussed during the Empirehood and to some extent the colonial era in standardizing some regional trade institutions.

Nonetheless, the rhetoric of the 1975 treaty was mainly of cooperation rather than integration. Furthermore, ECOWAS was faced with some economic and political challenges which made it difficult to attain the intended aims and objectives in the 1980s that is summarised in Table 3.1. It has been argued in some papers that the 1975 treaty was over-ambitious since the leaders did not cost how to achieve these aims and had multiple overlapping commitments (Geda and Kebret, 2002; Masson and Pattillo 2004 and Richard et al, 2010). Similarly, the 1980s-economic crisis and the increasing national debts contributed to the slow success of ECOWAS. Some countries resorted to protectionist measures by maintaining high tariff levels as well as not paying their dues to the ECOWAS (Orsini, 1994; Bundu, 1997 and Lavergene, 1997). ECOWAS members like many other

Sub-Saharan African countries depend on trade taxes as a source of total government revenue which ranged from 55% in Benin to 10.4% in Ghana during the 1970s (Renninger, 1979). This trend has not eased in recent years. In 2011, 17% of Ghana’s total government revenue emanated from trade taxes. For Benin, it was 23%; Cote D’Ivoire 39% and Senegal 12% in 2012 (World Development Indicators, 2015). Furthermore, Bundu (1997) found that per capita income growth fell from 1.5% in the 1960s to 0.7% in the 1970s and declined to -1.2% in the 1980s. As such, ECOWAS was economically constrained in achieving a common external tariff (CET) by 1990 because it lacked alternative sources of revenue to cater for the loss of revenue arising from lower tariffs. Table 3.1 shows the aims and timeline for achievement in the 1975 ECOWAS treaty.

Table 3.1 Aims and timeline of the 1975 ECOWAS treaty

Aims	Expected time of Attainment	Actual time of Attainment	Reasons for success or failure
Elimination of customs duties and other charges to importation and exportation of goods	1990 and then 2000	FTA achieved in 2004 although ROO limits the number of qualified goods	Failures due to over-dependent on trade taxes. More diversified domestic taxes needed to mitigate it
The abolition of quantitative and administrative restrictions on trade among the member states	1990 and then 2000	FTA achieved in 2004	Over dependent on trade taxes
The establishment of a common customs tariff and a common commercial policy towards third countries	1990, then 2000 and then 2011	On-going. Common CET achieved in 2015	Difficulty to gather resources to invest in the administration of the CET. Also, benefits are very diverse thus some nations could resist
The abolition of the obstacles to the free movement of persons, services, and capital	1994- period of 15 years from 1979 when the protocol was signed	Free movement of persons has been achieved at different periods up to 90 days	Success is due to ease of implementation. Also, many traditional and inter-state ethnic settlements exist. This makes it difficult or impossible to monitor cross border settlements and movements specially in the porous borders of West Africa
The harmonization of agricultural policies and the promotion of common projects in the member states notably in the fields of marketing, research, and agro-industrial enterprises;	No timeline set. However, ECOWAS common agricultural policy (ECOWAP) established in 2005.	On-going	ECOWAP has been established although its success is still early to say. However, a lot of resources are needed to implement ECOWAP initiatives
The harmonization of the economic and industrial policies of the member states and the elimination of disparities in the level of development of member states	No timeline set. UEMOA established in 1994 while WAMZ in 2000	On-going	Very small industrial base and economic size and initial levels of development make elimination of disparities difficult. Again, a lot of resources needed to reduce disparities.
The harmonization of the monetary policies of the member states	No timeline set	UEMOA and WAMZ have on-going convergence and harmonization of monetary and fiscal policy with no specific attainable timeline.	Constraint by the lack of resources arising from failures by members to pay annual dues.
The establishment of a Fund for Co-operation, compensation, and Development	Trade, customs, immigration, monetary and payment commission was set up in 1975	Established in the 1975 treaty although compensation payments are lagging. Actual protocol signed in 2002	Compensation started in 2004 although payments are lagging. Commission does not have the finance to pay

Source: See article 2 for the aims and article 12 for the timeline in the 1975 treaty. See UNECA April 2009 report on the status of integration in Africa.

Similarly, the achievements of ECOWAS and the expected gains from trade up to 1990 have been negligible since neither the common external tariff nor the customs union status was achieved (Omorogobe, 1993; Teunissen, 1996; Omorogbe, 2000; Kufor, 2000; Aryeetey, 2001; Jones, 2002 and Richards et al, 2010). We have discussed some of the economic difficulties the region was facing in the 1980s, including the low GDP growth and the heavy dependence on trade taxes as a source of government revenue. Deme (1995) using panel data from 1975 to 1991 found that the coming of ECOWAS has increased intra-ECOWAS trade contrary to Meagher (1997) and Hanink and Owusu (1998) who suggested that intra-ECOWAS trade would have increased regardless of ECOWAS due to the informal historical trade relations. It is not clear the extent to which the increase in intra-ECOWAS trade was due to demand for goods or improvements in the trade facilitation at the time.

Nonetheless, the failures to attain some of the objectives of ECOWAS necessitated a change of emphasis from cooperation to integration. This led to a revised treaty to be signed on the 24th of July 1993 (Keane et al, 2010 and Dijk, 2011). The revised 1993 treaty went a step further with the aim to establish an economic union by emphasizing integration through the improvement of political cooperation (Dijk, 2011). Therefore, it was realized that economic integration could not be sustained without political unity. To achieve economic union status, the 1993 treaty addressed issues on harmonization of trade and economic policy, establishing research on monetary and financial development, establishing a common currency and identifying the steps and institutions needed to accelerate integration (www.africa-union.org, ECOWAS Profile and Ogunfolu, 2009). Other issues that were addressed in the 1993 revised treaty included security and conflict prevention matters, governance and protection of the environment, which are now being administered by special technical commissions (Ogunfolu, 2009). Therefore, the 1993 treaty prioritized integration rather than cooperation.

Many resemblances exist between the 1993 and 1975 treaty. However, the 1993 treaty was significant since it empowered the executive secretariat to play a greater role in the integration process. The executive secretariat has now been transformed into the ECOWAS commission since 2007 with even greater powers and enforcement mechanisms. It is responsible for the day-to-day running of ECOWAS although the authority of the heads of states and governments is the highest decision maker followed by the council of ministers. As such, one of the fundamental challenges of ECOWAS is how to ensure agreements are properly implemented within the region (Ekpe, 2015). The political willingness to give up some sovereignty in exchange for common regional trade institutions could help improve the effective implementation of agreements. As we discussed in the previous two sections, the Empirehood was a successful trading period because the constituent parts were governed akin to a federal system which made the enforcement of common institutions feasible. In the absence of a central authority, other forms of cooperation including joint border customs and patrol of trade routes could minimize recurrent regional trade institutional challenges faced by cross-border traders including unnecessary road blocks and bribes payments that add to trade costs and uncertainty (Orsini et al, 1994; Gupta and Yang, 2007; Daboh, 2010; Hertzenberg, 2011; Brenton, 2012 and Cissokho et al, 2012).

Furthermore, we argue that the 1993 treaty created associated institutions which could facilitate the standardization of regional trade institutions. We shall discuss this in more detail in section 3.3.4. Notwithstanding, the slow pace of cooperation led to two developments which required some analysis because it characterized the process of integration and the development of regional trade institutions in ECOWAS after the 1993 revised treaty. That is the strengthening of WAEMU and the creation of WAMZ which has implication for the future role of ECOWAS.

3.3.2 ECOWAS, WAMZ and WAEMU debates and contradictions

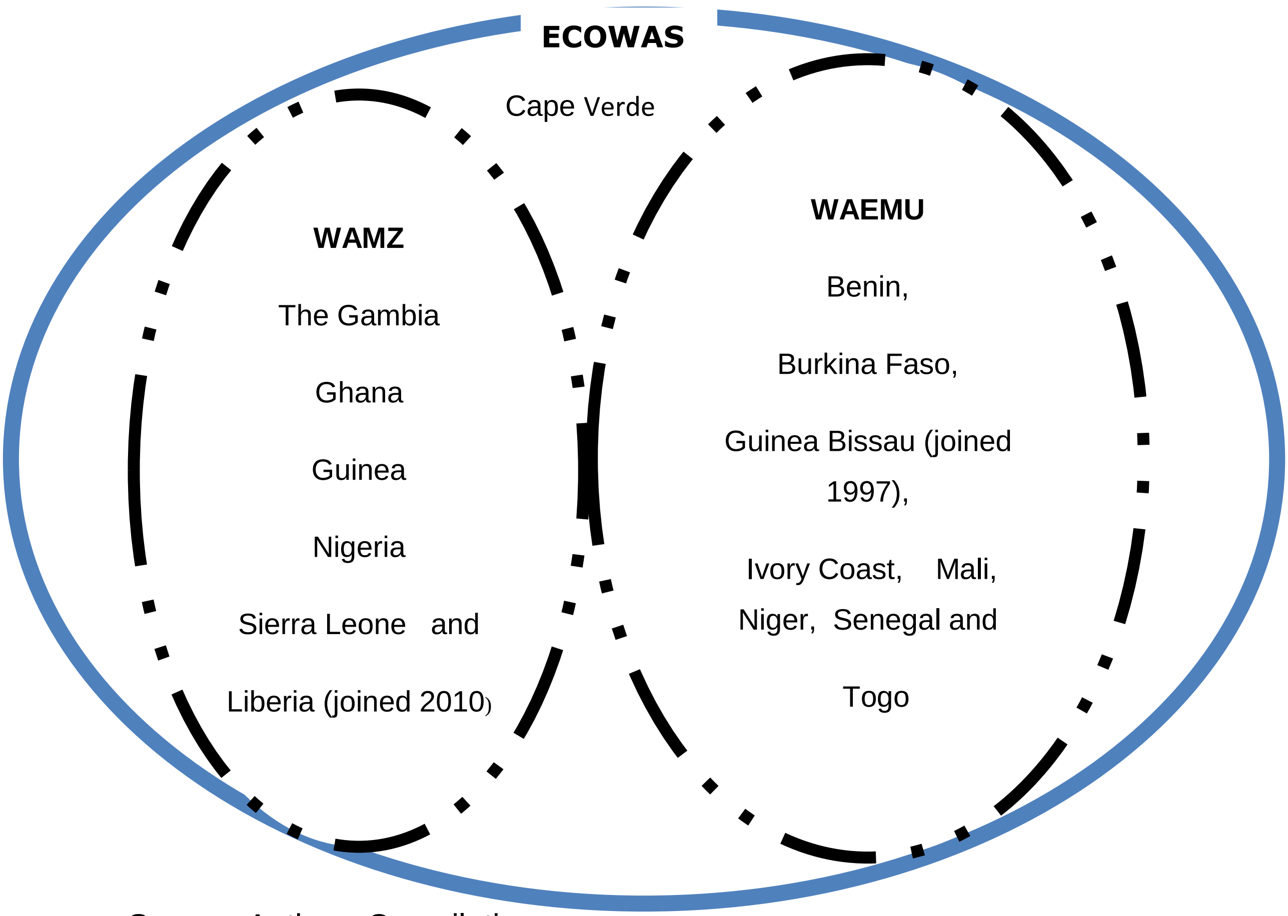
In the previous section, we established that the ECOWAS treaties created associated institutions which could facilitate the standardization of regional trade institutions. It was felt that integration in the whole of ECOWAS is difficult because of some differences in governance inherited from the colonial era. Therefore, two monetary zones were created within ECOWAS. Seven French-speaking countries of Benin, Burkina Faso, Ivory Coast, Mali, Niger, Senegal and Togo established the West African Economic and Monetary Union (WAEMU) on the 10th of January 1994 in Senegal, with the aim of promoting economic integration for countries sharing the single currency ‘CFA’ through the harmonization of fiscal and monetary policy (Debrun et al, 2005; Fielding et al, 2005 and Koussoube et al, 2011). Guinea-Bissau, which was a Portuguese colony, joined WAEMU on the 2nd of May 1997 as the eighth member. WAEMU is already a customs union with a common currency, Central Bank and a common external tariff (CET) (Debrun et al, 2005; Fielding et al, 2005; Koussoube et al, 2011 and Alagidede, Coleman and Cuestas, 2012). The first two institutions were inherited from the colonial era while the CET was introduced in 2000 (Goretti and Weisfeld, 2008). WAEMU has been hailed as the most successful regional grouping in Africa. It has an average CET of 12% within the 0-20% range (five bands) (Babatunde, 2006 and Oyejide, 2004). Furthermore, WAEMU, which maintained some of its institutions such as the common currency after colonial rule, is more integrated as well as a higher percentage of intra-ECOWAS trade. For example, intra-WAEMU exports were 16% and 15% of their total world exports in 1995 and 2013 while intra-ECOWAS exports were 10% and 9% in the same period (UNCTADSTAT).

The success of WAEMU resulted in the 1999 ECOWAS summit in Lome (Togo), the proposed establishment of a second monetary zone in order to fast- track the integration process (Shams, 2003; Ajayi, 2005; Tsangarides and Qureshi, 2008; www.wami.imao.org and Alagidede, Coleman and Cuestas, 2012). The West African Monetary Zone (WAMZ) was formed in 2000 on this basis by The Gambia, Ghana, Nigeria, Sierra Leone and Guinea Conakry. Subsequently, Liberia joined in 2010 as the 6th member (Odularu, 2009 and Boom, 2010). The aim of WAMZ like WAEMU is to promote economic integration through the harmonization of fiscal and monetary policy, particularly to introduce a single currency called ‘ECO’ and a single Central Bank (Shams, 2003; Ajayi, 2005; Tsangarides and Qureshi, 2008 and www.wami.imao.org). WAMZ members are characterized by separate currencies and central banks although the four British colonies and Liberia at some point had a common currency and central bank during the colonial era.

The introduction of the single currency is conditional on the convergence of certain macroeconomic indicators such as single digit inflation, fiscal deficit of no more than 4% of GDP and a stable exchange rate. However, the date for the launching of the 'ECO' has shifted many times because the convergence criteria have not been met by some countries. In order to facilitate the alignment of WAMZ and WAEMU, ECOWAS established the West African Monetary Agency (WAMA) in 2000 to prepare for the ECOWAS economic and monetary union (Alagidede, Coleman and Cuestas, 2012). Therefore, ECOWAS members recognized the importance of common and quality regional institutions as a prerequisite to expanding regional trade and development.

Figure 3.2 shows the composition of WAMZ and WAEMU countries within ECOWAS. Cape Verde is the only country which does not belong to either sub-group although they intend to join once the two sub-groups merge in the future.

Figure 3.2 Composition of WAMZ and WAEMU members within ECOWAS



Source: Authors Compilation

The results of empirical research into the feasibility of merging WAMZ and WAEMU and the expected benefits are mixed. Masson and Pattillo (2004) used a gravity model simulation and found that the alignment of WAMZ and WAEMU members is undesirable unless Nigeria implements effective fiscal discipline. Masson and Pottillo (2004) found that, if Nigeria can implement some fundamental economic changes, ECOWAS is bound to benefit. Babatunde (2006) has highlighted that Nigeria is making efforts to implement some of the issues raised by other members. Furthermore, Tsangarides and Qureshi (2008) using data from 1995 to 2004 found that the proposed WAMZ and subsequent merger with WAEMU are undesirable unless some economic indicators exhibit convergence between ECOWAS members. Aryeetey (1996 p.28) and Shams (2003) argued that WAEMU and WAMZ seem to be distinct entities counteracting each other's influence due to French influence on WAEMU. In contrast, Jones (2002) and Shams (2003) argued that ECOWAS does exhibit convergence characteristics although at the lower end (slow). Both findings highlight that the proposed ECOWAS monetary union is conditional on the convergence of their economic policies and a commitment to political unity or at least political cooperation in fiscal policies.

The failure to merge WAMZ with WAEMU will have deeper implications for ECOWAS. It will determine the extent to which ECOWAS influences decisions in the region. It will also determine the extent to which deep integration can be attained, as stipulated in the 1993 revised treaty. Furthermore, the failure to merge WAMZ with WAEMU will determine the extent to which the quality of regional trade institutional arrangements is effectively implemented. Given the extra cost of ECOWAS cross-border trade associated with weakness in trade institutions, the intra-ECOWAS trade could stagnate or contract in the future without integration or greater cooperation.

Therefore, the existence of WAMZ and WAEMU poses opportunities and challenges for ECOWAS in terms of whether it could lead to convergence or divergence of regional institutions. The West African Journal of Monetary and Economic Integration (WAJMEI) under the auspices of the West African Monetary Institute conducts research on various aspects of economic, social and infrastructure development that could guide ECOWAS integration policy (Daboh, 2010 and Adamu et al, 2010). There should be no contradiction between WAMZ and WAEMU although the alignment process has been slow mainly due to lack of fulfillment of obligations by member states (Uexkull, 2012). The general perception of ECOWAS members is that monetary union will be beneficial. This is reflected by the commitment of all members since 2000 to introduce 0.5% tax on imports to ECOWAS, called the community levy, with revenues used to fund development in the region. Nonetheless, the success of ECOWAS integration could start with the effective implementation of some aspects of the ECOWAS trade liberalization scheme (ETLS).

3.3.3 ECOWAS trade liberalization scheme (ETLS)

We discussed in the previous section that the existence of WAMZ and WAEMU poses opportunities and challenges for ECOWAS because it could determine the extent to which regional trade institutions converge or diverge. Furthermore, ECOWAS is faced with additional challenges of negotiating other trade liberalization schemes. One is within its member states and the other is with the EU through the Economic Partnership Agreement (EPA) and the African Union (Walkenhorst, 2006 and Milner, Morrissey and Zgovu, 2009). The motivation for trade liberalization has a long-standing theoretical underpinning within trade theory. Removing barriers to trade makes firms more efficient through competition, hence, the overall economy is bound to benefit from such efficiencies due to lower cost of production over time and eventually lower prices for consumers. The theories of trade liberalization will be discussed in more detail in chapter four.

Trade liberalization schemes face a lot of challenges for many developing countries including ECOWAS members. Indeed, Milner, Morrissey and

Zgovu (2009) argued that discussion about trade liberalization in SSA also means discussions about reforming the domestic tax systems. About 33% of ECOWAS member's government revenues are drawn from trade taxes on average (World Development Indicators). This figure had dropped to 19% by 2012 (World Development Indicators). With the exception of Nigeria, the maximum tariff rate for other ECOWAS members on average (MFN applied, simple average) was less than 20% (WITS Website). However, there is potential to increase tax revenues from tariffs if a maximum 20% is applied through a CET although this would imply higher prices of imports for consumers. Similarly, a higher tariff than the WTO bound rate can pose legal and compensation challenges from non-ECOWAS members. Diouf (2012) argued that only two ECOWAS members have a bound tariff of more than 35% in agricultural products. This means that the other ECOWAS members will not honor the multilateral commitments with the WTO if the maximum tariff is higher at 35%. There are several options available for ECOWAS such as a waiver from the WTO or adjusting other tariff bands.

Furthermore, it is not clear to what extent the ETLS leads to fiscal challenges. If the elimination of intra-ECOWAS tariffs results in proportionately higher trade flows, then the expected revenue losses can be minimized or eliminated through ad-valorem taxes and income taxes (Walkenhorst, 2006 and Milner, Morrissey and Zgovu, 2009). Most of the empirical papers argued that the failure of the ETLS in the past emanated from the anticipated revenue losses, which have made many countries reluctant to reduce tariffs, and the subsequent lack of the expected compensation scheme (Badiane, 1997 and Aryeetey, 2001). However, Goretti and Weisfeld (2008) argued that official tariff revenues from intra-ECOWAS trade averaged 0.1% of their GDP hence the revenue losses should be minimal. Another challenge with ETLS is whether individual members are ready to give up national trade policies in exchange for consolidated regional trade policies.

The divergence in tariff bands in the region required tariff alignment between WAMZ and WAEMU in preparation for ECOWAS CET. It was felt that

Nigeria should make substantial efforts to align its tariff rates with that of WAEMU since, without Nigeria leading, WAMZ would find it difficult to align with WAEMU (Babatunde, 2006).

Hence, the ETLS was launched on the 1st of January 1990 as enshrined in article 54 of the 1975 treaty (ECOWAS 1993 treaty and Aryeetey, 2001). The aim of the ETLS was to achieve customs union status in 2008 and subsequent monetary union by 2015 (AfDB, 2011). The ETLS asked for the removal of all tariff and non-tariff barriers (NTBs) within 15 years of its launch (by 2005) and the launch of CET by 2008. The process of launching the ECOWAS CET has been bumpy and slow. WAMZ members decided to pursue the existing WAEMU CET bands of 0%, 5%, 10%, 15% and 20% for a variety of products (Gupta and Yang, 2007; Daboh, 2010; Brenton et al, 2012 and Alohan, 2015). Nigeria wanted a 50% band levied on some agricultural products although it had to settle for a reduced 35% band (Diouf, 2012). Consumers would have to pay an additional 15% on such products entering ECOWAS unless Nigeria can supply them sufficiently at a low price or subsidize them through the ECOWAS compensation scheme. However, other ECOWAS members could potentially raise additional tariff revenue from the 35% band provided they meet the WTO requirements. Nonetheless, the process ended with the launch of the ECOWAS CET in 2015 and made one aspect of the ETLS a success as envisaged in article 54. Furthermore, the CET is an important development in the merger of WAMZ and WAEMU (ECOWAS, 2015; African Research Bulletin, 2015 and Norbrook et al, 2015).

It is too soon to assess the effectiveness of the ECOWAS CET but there is little indication of the mechanisms whereby ECOWAS will ensure that cross-border traders do not incur extra costs. Recent experience indicates that extra trading costs are not likely to decline unless ECOWAS takes a number of additional measures. Without the increase and expansion of trade, it is difficult to foresee how ECOWAS will meet other integration goals since trade is the single most important stimulus to any successful deeper integration scheme. Trade expansion would require improving the quality of regional trade institutions and standardization.

Another aspect of the ETLS as envisaged in article 54 is the elimination of non-tariff barriers (NTBs) which is expected to take longer. NTBs are increasingly being studied as barriers to trade (Keane et al, 2010; Brenton et al, 2012 and WTO Report, 2012). One aspect of NTB which has been the focus of discussion in this thesis is the quality of regional trade institutions which adds to trade costs. It is expected that ECOWAS could improve them in order to reduce trade costs.

Keyser (2012) and Brenton et al (2012) found that cross-border traders within ECOWAS pay an estimated US$100 on average per trip in bribes mainly at border points and unofficial road blocks. Cissokho et al (2012) also surveyed truckers between the Dakar-Bissau and Dakar-Mali corridors and found that truckers pay an estimated US$129 in bribes per trip of 666 kilometers. Research has found that reduction in transport cost of 10% of agricultural products at the farm gate could lead to four percent increase in production and real income of farmers as well as 8% fall in food prices (USAID, 2011 and Brenton, 2012). Furthermore, traders in SSA face more constraints due to costly documentations, poor standards and border controls than anywhere in the world (Hertzenberg, 2011; Brenton et al, 2012 and Rugwabiza, 2012). Long delays and unnecessary paperwork at border points also add an estimated US$0.04-0.10 per ton kilometer for long distance road transport within West Africa in contrast to US$0.03-0.04 per ton kilometer in OECD countries (Brenton et al, 2012). These unexpected costs were discussed by the ECOWAS president in an interview with the multimedia ECOWAS communication network on the 28th of May 2015 to mark ECOWAS 40-year anniversary (Multimedia ECOWAS communication, 2015). They signal the presence of regional trade institutional failures which could be addressed by reflecting on historical good practices and some of the current institutions in the ECOWAS.

Regarding the EPA, trade liberalization is expected to have a much bigger fiscal impact given that most ECOWAS trade flows are with the EU. Indeed, Busse and Grossmann (2004) estimated that ECOWAS members will lose about 20% of government revenue because of the proposed EPA agreement to reduce tariffs. However, the EU has pledged a compensation fund and aid for trade mechanism. Milner, Morrissey and Zgovu (2009) also alluded to the significant revenue losses and adjustment costs of the EPA for ACP countries, especially in employment. Furthermore, the drop in the revenue from trade taxes has been accompanied by a higher tariff bands in the ECOWAS CET. Nevertheless, Goretti and Weisfeld (2008) argued that the EPA would bring political momentum in ECOWAS in order to address the regional NTBs that have in part inhibited intra-ECOWAS trade. Nonetheless, these overlapping liberalization schemes are likely to prolong the effective implementation of all.

Therefore, our discussion in this section suggests that the launch of the CET is an important milestone although it is too soon to assess its effectiveness. Nevertheless, the NTB did not improve as expected within the ETLS. We argue that some ECOWAS institutions could facilitate the improvement and harmonization of some NTBs. We shall discuss this in the next section.

3.3.4 Current institutions of ECOWAS and the quality of regional trade institutions

The aim of this section is to discuss current institutions of ECOWAS and the extent to which some of these institutions could facilitate the standardization of regional trade institutions. ECOWAS has gone through a lot of transformation since the revised treaty of 1993 and the subsequent formation of WAEMU and WAMZ in 1994 and 2000 respectively. The institutions that are responsible for the day-to-day running of ECOWAS have also been transformed. Currently, ECOWAS has seven main institutions and a host of technical agencies that govern its activities (www.comm.ecowas.int) namely;

- The authority of heads of states
- The council of Ministers
- The commission which was the Executive secretariat in the 1993 treaty and has now got more powers
- the community parliament
- the community court of justice and

- ECOWAS Bank for Investment and Development (EBID) which was the fund for cooperation, compensation, and development (or the ECOWAS Fund).
- Other Technical Agencies includes;
- West African Health organization
- West African monetary agency
- West African monetary institute
- ECOWAS youth and sports development center
- ECOWAS gender development center
- Water resources coordination unit
- ECOWAS BROWN Card
- The Inter-Governmental Action Group against Money Laundering and Terrorism Financing in West Africa (GIABA)
- The West African Power Pool

These seven institutions are an amalgamation of wider institutions which had been streamlined in order to reduce overlaps and improve the effectiveness of policy implementation (www.ecowas.int). Each of these institutions is assigned specific functions aimed at accelerating the integration process. The model resembles the European Union operational structure. Some institutions can play a greater role in easing some of the urgent and recurrent challenges faced by cross-border traders including non-convertibility of currencies, bribes payments at border points and long delays which point to regional trade institutional failures.

We argue that there are four institutions in ECOWAS which are vital in the integration process and the harmonization of regional trade institutions namely; the West African Monetary Agency (WAMA), EBID, the community court of justice and the ECOWAS parliament. While WAMA and EBID could facilitate the launch of a common currency and a central bank or at least enable the convertibility of currencies, the court of justice and ECOWAS parliament could address the extra costs incurred by cross-border trader's due to the weakness of regulatory quality of cross-border trade, poor monitoring and protection of trade routes, weak enforcement and punishment mechanism (weak rule of law) for those who break ECOWAS protocols and lack of sensitization of traders regarding their rights under the ECOWAS customs union. Therefore, ECOWAS needs to operate beyond the office, beyond paper agreements and announcements by extending its operations at the border points in order to improve the effective implementation of trade rules and regulations. We shall discuss these four institutions in more detail.

WAMA is working towards the creation of an ECOWAS single currency and central bank. It is currently the ECOWAS clearing house that manages trade and financial transactions through the clearing and payments system of the central banks of ECOWAS members. The launch of an ECOWAS wide common currency can minimize transaction costs, although it is not a sufficient condition to stimulate intra-ECOWAS trade. Nonetheless, the non-convertibility of ECOWAS currencies outside the formal banking system has made a trade and financial transactions difficult (Cincin-Sain and Marshall, 1983). Hence, a common currency and central bank could be desirable (Meagher, 1997). It is not clear when the single currency and the central bank is going to be launch. Nonetheless, the evolution of a common currency shows drawbacks relative to the colonial and Empirehood era. The colonial era encompassed two currencies while the Empirehood used the cowrie extensively as a common currency. Furthermore, other mediums of exchange were convertible at the time (Hogendorn and Johnson, 1986; Conrad, 2010 and Hopkins, 2014).

EBID was formerly called the ECOWAS Fund in the 1975 treaty ((www.ecowas.int). It was established as a regional holding company in 1999 and started operating in 2003 (Ogunfolu, 2009 and EBID, 2014). Being a holding company means it can hold shares in other companies and can issue shares which give the bank access to wider sources of finance. EBID initially has two subsidiaries namely the Regional Development Fund and Regional Investment Bank. The Regional Development Fund was assigned to finance infrastructure developments including trade facilitation as stated in article 2.2e and 2.2f of the ECOWAS treaty. The Regional Investment Bank serves as the ECOWAS Bank and it is hoped that it will eventually become the main central bank once WAMZ and WAEMU are merged. However, the two subsidiaries were remerged to reduce costs and overlap on the 14th June 2006 (EBID, 2014). The merger of EBID and WAMA could further save costs since their role seems to overlap. Therefore, EBID has the potential to fund the harmonization of regional trade institutions and to fund the effective implementation of common institutional arrangements. Efforts are being made to construct Joint Border Posts (JBP) such as Noepe-akanu between Ghana and Togo; Seme-Krake between Nigeria and Benin and Elubo-Noe between Ghana and Cote d'Ivoire and the trans-Gambian transport corridor between the Gambia and Senegal (ECOWAS Infrastructure, 2015). It is hoped that these JBPs will reduce border crossing times by 3 hours, as well as speed up pre-clearance of trucks by information and equipment sharing (ECOWAS Infrastructure, 2015). Table 3.2 shows some major institutional developments in the region.

Table 3.2 Major Developments in West Africa after 1993 revised treaty

Institutions	Year Formed	Aims	Achievements
WAEMU –West African Economic and the Monetary Union	1994	Deep integration	Free Trade Area (FTA), Central Bank and single currency- the CFA
WAMA- West African Monetary Agency	1996	Establish clearing house to ease trade and financial transactions, common currency ‘ECO’ and central bank	In progress but some nations have got common clearing house policies
WAMI- West African Monetary Institute	2000	Prepare to establish Central Bank and ECO through convergence	Working progress to align exchange rates of non-WAEMU members excluding Cape Verde with WAEMU
WAMZ- West African Monetary Zone	2000	Convergence of economic policy and exchange rate	In progress. The aim is to harmonize monetary policy of non-WAEMU members to prepare for the single currency and central bank.
EBID- ECOWAS Bank for Investment and Development	1999 started operation in 2003	Promote and implement infrastructure development	On-going and does finance some projects. Main investment focuses on telecommunication.
ECOWAS Common Industrial Policy	2010	Increase share of intra-ECOWAS trade to 40% by 2030 with solid industrial structure	In progress. EBID is funding some projects to improve manufacturing

Source: Authors Compilation. Note: Based on these institutions, it seems that ECOWAS is more focused on achieving a single currency and Central Bank as a prerequisite to accelerate integration in other sectors. The challenge for ECOWAS is whether monetary policy alone can help increase economic activity that is able to generate more trade and employment for a population that is still detached from the formal economy and access to finance.

The ECOWAS parliament is delegated to facilitate the integration process with the support of the community court of justice. The trade, customs and free movement of persons (TACFEMP) as well as the legal and judicial affairs committee are important sub-committees of the ECOWAS parliament. In addition to other duties, the TACFEMP committee is responsible for developing legal rules regarding the establishment of the economic and monetary union (article 55 of the 1993 revised treaty), which was scheduled for 2008. Furthermore, the committee considers the regulation of customs procedures, payments and other trade-related rules as stipulated in Chapter VIII, as well as supporting the coordination of the judiciaries through the community court of justice, on trade-related disputes (ECOWAS Parliament, 2014). Therefore, the two institutions have the potential to implement systems that protect trade routes, enforce the ECOWAS protocols and to sensitize citizens.

In terms of the protection of trade routes from unofficial roadblocks and bribe payments, the Empirehood had armies that patrolled trade routes that were funded from trade and production taxes. This was consolidated by common rules applied to settle trade disputes in which the royal courts would hold those who harassed traders to account. ECOWAS can also fund security personnel to patrol trade routes, possibly through the individual national armies through common rules emanating from the ECOWAS parliament. In the short run, ECOWAS needs to station representatives at border points, whose role would be to monitor the ECOWAS customs union protocols. The World Bank has similar arrangements with many SSA countries, where they have operational staff representing them in various government sectors in order to manage their lending and to minimize corruption (The World Bank Group, 2012). In the Empirehood, the King had representatives in each kingdom whose role was to monitor rules and regulations.

The enforcement and punishment mechanisms could be strengthened in order to punish those who harass traders at border points and unofficial roadblocks. ECOWAS members could adhere to common rules (rule of law) on the kinds of punishment and who should incur the legal costs and the court of justice can play an active role. This is important because if the cost to traders of taking legal action is higher than paying bribes, there is no incentive to take such legal action. Hence, ECOWAS should take the costs away from traders in order to motivate them to report their grievances. Additional measures such as improved pay for customs officials and other security agencies can reduce the motivation for taking bribes.

The sensitising of cross-border traders regarding their rights under the ECOWAS customs union can improve regulation and implementation of cross-border trade. The single education system inherited from the colonial era could be improved to stimulate a common mindset. People can only exercise their rights if they know what they are. Research has found that education does determine institutional quality (Mocan, 2008; Acemoglu et al, 2005 and Alonso et al, 2013). The citizen's forum held in Burkina Faso in July 2014 is a step in the right direction (Multimedia ECOWAS Communication, 2015). However, the media can play a greater role in sensitizing citizens about their rights. This will require ECOWAS initiatives to increase the visibility of ECOWAS in all the media outlets in the region. In addition, ECOWAS could organize regional wide workshops and training schemes for customs officials and all stakeholders in cross-border trade. The workshops could cover the ECOWAS protocols and the binding legal implications for breaches. This will require a database where all or at least the majority of cross-border traders can register. Ojide (2010) has found that ECOWAS citizens are less sensitized about their rights and the benefits of integration relative to other regions and that this has contributed to the poor implementation of protocols.

Therefore, our evaluation and findings suggest that some regional trade institutions have gone backward from their historical level. It should be noted that WTO rules such as article 24 entail provisions that allow free movement of goods and services and through RTAs such as ECOWAS. Moreover, ECOWAS also has provisions for free movement of goods and people. However, there is insufficient implementation and monitoring of these protocols that has contributed to the extra costs associated with ECOWAS cross border trade (Keyser et al, 2012). Table 3.3 summarizes the evolution of these selected institutions. The Empirehood and colonial era experienced common regional trade institutions relative to the current situation in West Africa. Hence, we can establish that some facets of these institutions were abandoned after independence especially among the English-speaking countries.

Table 3.3 Development of selected regional trade institutions in West Africa

Institutions	Empirehood	Colonialism		Post-independence	
	West Africa	English	French	English	French
Common currency	Y	Y	Y	N	Y
Standardized trade rules	Y	Y	Y	N	N
Protected trade routes	Y	N	N	N	N
Royal Courts	Y	N	N	N	N
Single administration	Y	N	Y	N	N

Source: Authors compilation. Note: Y=yes, the institution exists; N=no, institution did not exist

Measures geared toward improving the quality of regional trade institutions, especially regulation of cross-border trade through enforcement of protocols, protection of trade routes, a common currency and sensitization of citizens could be prioritized if ECOWAS is to expand trade flows. Indeed, Efobi and Osabuohien (2011) recently found that improving the quality of trade institutions in tandem with infrastructural development will promote intra-SSA trade. In the long run, ECOWAS could align all its policies and pursue a federal style administration if there is a desire to maintain regional peace and security with the goal of improving the standard of living of its citizens through economic development stimulated by trade and investment.

3.4 Chapter summary

The aim of this chapter was in two-fold. The first was to describe the evolution of regional trade institutions from the Empires of Western Sudan to the present day in order to reflect and to identify what has remained of them. The second was to discuss what has happened to regional trade institutions in West Africa post-independence and the extent to which the creation of ECOWAS and its associated institutions could further strengthen the development and standardized regional trade institutions. We argue that a holistic evaluation of the extent to which regional trade institutions evolved is lacking in the existing literature relating to West Africa. We found that regional trade institutions were more standardized across West Africa before the current countries gained their independence, including a common currency, enforcement of protocols through royal courts and chiefs, protection of trade routes from corruption and a federal style administration. Societal norms and political consensuses such as the 'Mande charter' and the coming of Islam created a discipline that provided confidence in the ability to trade, which was facilitated by common regional trade institutions. The colonial era also established common institutions which could have been vital in promoting regional trade and that these regional trade institutions were not entirely dissimilar to those of the Empirehood.

Historical changes in governance resulted in the loss of some facets of these well-functioning regional trade institutions. Therefore, the development of regional trade institutions experienced drawbacks after many ECOWAS countries gained their independence, although historical reflection could provide important guidance for policy makers currently involved in deepening the integration of the ECOWAS.

Furthermore, we argue that the unexpected trade costs at border points and unofficial roadblocks are still ongoing and signaled the failure of four regional trade institutions. We argue that WAMA and EBID could facilitate the launch of the common currency and central bank or at least facilitate the convertibility of currencies, while the ECOWAS parliament and the community court of justice could implement common rules and systems in order to protect trade routes, enforcement of ECOWAS protocols and sensitization of traders. This must be accompanied by the willingness to punish those who harass traders, where officers must also be given incentives in order to reduce the opportunity to take bribes. ECOWAS could also make use of media outlets in order to sensitize its citizens of their rights.

The current priorities in ECOWAS focus on aligning the WAMZ and the WAEMU, with the goal of launching a common currency and a central bank. This is reflected in the skewness of research papers looking at the feasibility of a monetary union. Although a common currency may be welcome news, it will not address other recurrent challenges faced by cross-border traders regarding bribe payments at border points and unofficial road blocks. The ECOWAS president has acknowledged little progress in this area. ECOWAS members have signed the protocols on the free movements of persons and goods; hence traders should not incur any uncertainty of trading costs. Furthermore, the ECOWAS CET came into force in January 2015 and should further eliminate costs. The launch of the CET was conditional on Nigeria making efforts to align its high tariff level with that of other ECOWAS members. Therefore, there is hope that Nigeria could continue to address some concerns of the other ECOWAS members.

Furthermore, ECOWAS has the potential to expand intra-regional trade if the improvement of regional trade institutions is prioritized. This would require personnel to patrol trade routes as well as ECOWAS staff at border points in order to monitor the implementation of protocols, in the same way, that royal armies patrolled trade routes during the Empirehood and royal officials in each province monitored arrangements. A federal style administration could be the sustainable long-term approach to a successful integration scheme, although this would require a political commitment to give up sovereignty at the national level.

This chapter argues that historical context can provide policy makers with confidence that the current regional trade institutional barriers to trade can be addressed in order to improve the quality and effective implementation of regional trade institutions. This could help to accelerate the integration process in order to realize the full potential of regional trade. In the next two chapters, we will discuss the conjunction of factors which could determine these institutional failures and drawbacks from a theoretical and modeling perspective in order to strengthen our policy implication.

CHAPTER FOUR
Intra-regional trade flows: the experience of the ECOWAS integration scheme

4.0 Introduction

Regional integration involves a group of countries liberalizing their markets for trade and other economic activities (Laird, 2002; Biswaro, 2012 and WTO report, 2012). In Africa, every country belongs to one or more regional trading agreement (RTA) (Gupta and Yang, 2007; Babatunde and Odularu, 2012 and Mengistu, 2015). However, drivers of regional integration and a deeper understanding of the pattern of trade as well as what causes successes in regional trade between developing nations have not been fully researched. That is, the quest for regional integration might be regional specific such as the extent to which political and cultural factors outweigh economic factors (Wunderlich, 2007). To improve our understanding of the drivers of RTAs in developing countries, it is useful to have an in-depth assessment of an integration scheme such as ECOWAS as a case study.

Trade within developing countries has increased in the past decade, which suggests that further liberalization could be beneficial. For example, intra-developing countries trade as a percentage of their total trade rose from 40% in 1995 to 59% in 2014 at a time when trade barriers are being reduced. However, there are regional variations in intra-developing countries trade as shown in Table 4.1 below (UNCTADSTAT, 2016 and Lombaerde-De et al, 2008).

Table 4.1 Intra-regional trade as a percentage of their total trade (X+M)

Region/ Year	**1995**	**2014**	**% Change**
Africa	12	15	**25**
Asia	40	54	**35**
Americas (developing)	20	18	**-10**
Europe	70	65	**-7**
West Africa	10	10	**0**
Southern Africa	9	15	**67**

Source: Authors Compilation: Data from UNCTADSTAT.

For example, intra-West African trade stalled at 10% on average, while intra-Southern Africa trade rose proportionately by 67% (WTO Report, 2012; UNECA Report, 2012 and UNCTADSTAT, 2016). As such, the distribution of intra-developing countries trade is uneven (Qureshi, 1996). Only few countries and products accounted for most intra-developing countries trade that may have implications for the success of integration schemes due to issues relating to political commitments, income distribution and output and employment losses (Qureshi, 1996; Stiglitz, 2002 and Rugwabiza, 2012).

Furthermore, Table 4.1 also shows that the share of intra-regional trade in some developing regions is low. This has generated some debate about the extent to which regional integration schemes among developing nations (south-south) alone is beneficial or not (Bhagwati, and Panagariya, 1996; Venables, 2003; Dunn and Mutti, 2005 and Gupta, 2008). Some papers argued that RTAs which entail deeper integration schemes could experience significantly higher gains from trade because they lower trade costs and provide a stable trading and monetary system which national governments alone may fail to achieve (Dunn and Mutti, 2005; Evans et al, 2006; WTO Report, 2011 and Lejárraga and Shepherd, 2013). Other papers argue that deeper integration between north-south could potentially be more beneficial because the south could learn best-practices from the north

(Winters, 1996; Schiff and Winters, 2003 and WTO Report, 2011). However, deeper integration requires common rules, although this could put pressure on the economies of some developing nation's whose level of integration and development may require divergent policies. Nevertheless, some papers highlighted that intra-developing countries' trade was rising strongly through unilateral and multilateral liberalization before some of the agreements were made (Global Economic Prospect Report, 2005). As such, the type of integration countries should pursue and with which groups of countries is of importance to many stakeholders?

Therefore, the aim of this chapter is three-folds. The first is to discuss the theoretical arguments that underpin the motivation for the formation of ECOWAS. This will enable us to locate ECOWAS in the context of global and regional trade. The second is to assess the degree of intra-ECOWAS trade and trade with the rest of the world by product categories. This will enable us to identify the successes of ECOWAS as well as to assess which product categories are driving trade flows. The third aim is to measure the ECOWAS trade potential using some trade indicators in order to assess the extent to which this potential is exploited. Furthermore, estimating ECOWAS trade potential could reveal the extent to which their model of integration is influenced by trade theory.

The structure of this chapter is as follows. Section 4.1 looks at the basis for regional integration and trade from a theoretical perspective while section 4.2 assesses the contextual literature. Section 4.3 examines ECOWAS trade patterns. Section 4.4 measures ECOWAS trade potential utilizing the revealed comparative advantage (RCA) and trade complementarity indices (TCI). Section 4.5 looks at some indicators in ECOWAS, which could shed light on the extent to which some product categories could stimulate regional trade, especially in the primary sector. Section 4.6 concludes the chapter.

4.1 Theoretical framework

This section analyses the theories underlying trade and regional integration schemes in order to assess the extent to which they explain trade patterns, especially in West Africa. It is generally agreed among economists that no country could produce all the goods and services as well as possess all the inputs needed in modern production processes (WTO Report, 2008). Furthermore, consumers are increasingly demanding a variety of products that could be relatively more expensive when produced at home. These have accentuated the need for trade. What determines trade, the pattern it takes, and which products are traded could depend on the expected gains from trade, production potential, and consumer choice.

The premise of the expected gains from trade hinges on the assumption that world prices are divergent from domestic prices in autarky with two possible outcomes (Dunn and Mutti, 2005; Nielsen and Zouhon-Bi, 2007; WTO Report, 2008; Schumacher, 2012 and Cissokho et al, 2012). First, if world prices are lower than domestic prices for some products, countries could utilize less of their domestic resources (income) by importing from efficient countries. Furthermore, it allows those countries to reallocate resources in their efficient sectors which would naturally lead to specialization of production and competitiveness while inefficient sectors are crowded-out by imports. However, resource reallocation could lead to a shift in production structures and migration which may not be politically popular. The second likely outcome is that when domestic prices are lower than world prices for some products, countries could benefit by exporting to the world market in order to increase their growth and employment prospects (WTO Report, 2008). As such, free trade ensures allocative and accumulative efficiencies (Dijk, 2011). Furthermore, the proponents of free trade argue that small economies which cannot influence world prices might benefit more from free trade than restricted trade because consumers would have access to cheaper products with better quality and varieties while producers have access to larger markets (WTO Report, 2008 and Schumacher, 2012). Therefore, global free trade should be the first best option. In the absence of global free trade, small economies could form a regional integration scheme as a second-best option in order to minimize the problems associated with small economic size (Oduro and Aryeetey, 1996; African Union Report, 2012 and EDA Report, 2013).

This section will demonstrate how the traditional trade theories of comparative advantage and the new trade theories of economies of scale explain the basis for trade. We will particularly look at mercantilism, the Ricardian and Heckscher-Ohlin (HO) models and new trade theory.

4.1.0 The traditional trade theories

Mercantilists' trade theories assumed that a nation could increase its wealth by exploiting its trade potential. The key aspect of mercantilism is that the gains from trade can be exploited if countries promote their export sectors more than the import sectors through protectionist measures (Krugman and Obstfeld, 2009; Schumacher, 2012 and Feenstra et al, 2012). Therefore, under mercantilism, domestic consumers could pay a higher relative price for products and domestic producers could experience the inefficient use of resources, although the government could receive revenue from import taxes. Some aspects of import substitute industrialization (ISI) pursued by many developing nations in the 1950s to1980s were partly mercantilist and inward-looking (Sachs and Williamson, 1985 and Lombaerde De, Estevadeordal and Suominen, 2008 and WTO Report, 2008). Furthermore, mercantilism contributed to the development of trade policy instruments which resulted in the modern tariff and non-tariff barriers (Dunn and Mutti, 2005). Moreover, we demonstrated in chapter three that the Empires of Western Sudan also had tariffs. It has been argued that trade barriers are intended to protect employment, promote industrialization and increase export potential as well as revenue generation (Tanzi and Zee, 2000; Ekpo, 2004 and Walkenhorst, 2006). However, mercantilism could also lead to retaliation by trading partners, which may have negative economic consequences. As such, it does not offer a strong basis for free trade, although trade barriers could improve our understanding of some of the dynamics driving free trade. The inward-looking nature of mercantilism necessitated the search for alternative trade theories (Bjornskov, 2005; Salvatore, 2013).

These alternative trade theories hinge on the principle of absolute and comparative advantage which asserts that a nation could increase its wealth and reduce poverty without protectionist measures (Bjornskov, 2005 and Leyaro and Morrissey, 2010 and Schumacher, 2012). Absolute advantage refers to the ability to produce products more efficiently compared to other countries/firms. It occurs when absolute production costs fall in the whole economy or firm, which will show up as higher real income (Acharya, 2008 and Sen, 2010). However, it does not offer the only costs basis for trade. Although it is unlikely, a country could have an absolute advantage in the production of most of the tradeable products which leaves the other trade partners with few products to trade with. This scenario is likely to motivate protectionist measures when some trade partners fear the economic consequences of trade being skewed toward few countries. Furthermore, although it is plausible for production costs to fall as output rises in the whole economy, absolute advantage does not tell us a number of resources allocated to the production of each product. An understanding of inputs required in sectoral production could reveal which sectors are more cost efficient and the extent to which resource reallocation and specialisation could lead to production surplus and export.

The theory of comparative advantage known as the Ricardian model that was later developed into the Heckscher-Ohlin model extended absolute advantage by looking at relative cost rather than absolute costs that attempts to explain the concept of resource allocation as a basis for trade.

Comparative advantage postulates that countries could benefit from trade even in the presence of absolute advantage if there are differences in the opportunity costs of production (Deardorff, 1998 and Sen, 2010). That is if they could specialize in producing products which could be produced at the lowest opportunity costs (Husted et al, 2013; Bjornskov, 2005; Salvatore, 2013; Krugman and Obstfeld, 2009 and Feenstra et al, 2012). Forgoing few inputs in order to produce more of another product will generate costs savings and efficiencies that will make the product more price competitive. Opportunity cost is an important aspect of comparative advantage and in economics because it determines choices between alternatives (WTO Report, 2008). Two comparisons need to be made in order to understand comparative advantage as a basis for trade. The first is the opportunity cost of production within a country. Second is the opportunity cost of producing similar products between potential trading partner's (Acharya, 2008 and Beaudreau, 2013). Both should lead to resource reallocation through specialization which leads to efficiencies in production. Furthermore, differences in opportunity costs occur due to differences in factor prices. Therefore, opportunity costs could determine the extent to which countries pursue a global free trade or become part of a regional integration scheme. Comparative advantage did not make a clear distinction on that choice. Therefore, computing the comparative advantage of countries could shed light on the extent to which trade liberalization could be mutually beneficial regardless of geographic proximity. A detailed assessment of factors which determine comparative advantage will further shed light on the pattern of resource reallocation.

The Ricardian and Heckscher-Ohlin models made different assumptions about the sources of comparative advantage. While the Ricardian model assumes that comparative advantage emanates from differences in the efficiency and productivity of labour, the Heckscher-Ohlin model assumes that comparative advantage emanates from differences in factor endowments including labour, capital, land and other resources (Salvatore, 2013).

Therefore, comparative advantage raises several issues regarding trade patterns. First, countries with identical factor endowments would be expected to trade less among themselves. The proponents of north-south trade liberalization argue that many southern countries have similar factor endowments which make it less plausible to trade among themselves. Secondly, factor endowments could fluctuate over time, which implies that comparative advantage could change. For example, improvements in the use of fertilizer and other technologies in the agriculture sector could improve yields per hectare which will lower average costs and lead to economies of scale. Improvements in yields coupled with a reduction in costs of production could attract greater demand for products in the global or regional markets. Furthermore, improvement in human capital through higher education and skills as well as capital investments in some selected sectors such as infrastructure and the institutional framework could improve comparative advantage. Third, comparative advantage could lead to the development of new products or markets if some sectors of the economy are under exploited. Therefore, while comparative advantage may be due to current endowments, countries could create their comparative advantage in some sectors with the right policies.

In summary, our discussion of the traditional trade theory highlights that the concept of comparative advantage is plausible in determining the basis for trade. The Ricardian and Heckscher-Ohlin models made different assumptions about the sources of comparative advantage. The Ricardian model assumes that it is differences in labour productivity, which determine comparative advantage while the Heckscher-Ohlin model assumes that it is differences in resource endowments. Both are plausible because trade patterns are based on differences in the opportunity costs of production. However, comparative advantage implies that countries with similar economic structures and opportunity costs of production may trade less among themselves. Therefore, it is befitting to compute the revealed comparative advantage (RCA) of countries in order to assess the extent to which trade liberalization is desirable. Furthermore, it is plausible to assess factors which determine comparative advantage and trade barriers in order to understand the dynamics driving trade patterns. In this thesis, we will use ECOWAS as a case study. Furthermore, comparative advantage does not capture the extent to which production complementarities could lead to greater trade in semi-processed products (Beaudreau, 2013). This has led to the development of new trade theories in the last three decades.

4.1.1 The new trade theory (NTT)

The failure of the traditional trade theory to explain the pattern of trade between countries with similar economic structures led to the search for new theories. The new trade theories (NTT) extended the concept of comparative advantage by assuming that the modern pattern of trade exhibits imperfect markets with differentiated products (Krugman, 1979 and WTO Report, 2008). Furthermore, production is characterized by increasing returns to scale (more output per unit of input), greater consumer choices and production complementarity (Melitz, 2003 and Krugman and Obstfeld, 2009). Hence, the new trade theory did not discard specialization. Rather, it assumes that specialization is achieved through intra-industry trade influenced by production complementarity and product differentiation which lead to economies of scale. Therefore, we need to discuss the conditions and dimension under which the new trade theory explains the basis for trade and trade patterns.

The first condition pertains to the degree of production complementarity. When some firms within the same industry can specialize in the production of some components of a whole based on differences in opportunity costs, the average cost will fall which leads to increasing returns to scale. Thus, free trade could enhance production complementarity where firms could exploit increasing returns to scale beyond their national borders. Beaudreau (2013) described this type of trade as exploiting the vertical comparative advantage. However, what is interesting to note is that production complementarities or vertical comparative advantage would require the existence of a significant manufacturing sector. Indeed, the WTO Report (2008) summarized several papers which found that complementarities are mainly prevalent in the manufacturing sectors and in developed nations. Therefore, the feasibility of production complementarities in developing countries would require improvements in processing and manufacturing (Iyoha, 2005; McIntyre, 2005; Donge et al, 2012 and Shinyekwa, and Othieno, 2013). The second condition relates to access to new markets by firms. New markets could lead to more demand for products which consequently lead to more production. The spread of costs to a larger output lowers the average cost which brings increasing returns to scale (WTO Report, 2008). This occurs because firms can use their proceeds to invest in new technology or an economy-wide fall in average cost leads to the use of fewer inputs. Access to new markets would require better market information and lowering of trade barriers. Furthermore, NTT assumes that firms could exploit economies of scale in imperfect markets where early entrant firms dominate the market and prevent new entrants and competition.

Although NTT is plausible in explaining trade patterns and the basis for trade through economies of scale, it poses some challenges for some developing nations especially those with a low manufacturing base. Firms from developed nations could crowd-out firms in developing nations when imperfect market conditions prevent them from entering the global market. Hence, developing nations could use the infant industry argument to introduce trade barriers contrary to the spirit of global trade liberalization. Similar arguments could be made to justify the formation of RTAs in order to exploit regional competitiveness. However, the infant industry argument could be minimized if multinational firms expand their operations in developing nations through foreign direct investment (FDI). This would require developing countries to improve their institutional framework and ease of doing business.

Nevertheless, the relevance of the NTT in explaining modern patterns of trade among countries with similar technology and resource endowments cannot be underestimated. The key aspect of NTT as a basis for trade is that countries with similar economic structures can still trade with each other in the presence of production complementarities and imperfect markets. This is achieved through intra-industry trade. Furthermore, consumer demand for branded products could lead to improvement in packaging and product differentiation which has the potential to increase trade. Table 4.2 summarizes the trade theories. However, global free trade is facing increasing challenges from RTAs. As a result, research has also focused on looking at the basis for the formation of RTAs from a theoretical perspective and its implication for global free trade.

Table 4.2 Summary of trade theories

Trade theories	Basis for Trade assumptions	Main Targets	Types of products traded	Economies of scale	Factors of production
Absolute Advantage (18th C)	Absolute advantage determines trade	Interindustry trade	Homogenous productivity across firms	Increasing returns to scale	2 nations 2 goods 1factor Immobile factors
Ricardian Theory (18th&19th C)	Comparative advantage determines trade	Interindustry trade	Homogenous productivity across firms	Constant return to scale	2 nations 2 goods 1 factor Immobile factors
Heckscher-Ohlin Theory (19th&20th C)	Differences in resource endowments	Interindustry trade	Homogenous productivity	Constant return to scale	2 nations 2 goods 2 factors Immobile factors
New Trade Theory (the 1980s)	Production complementarity	Intra-industry trade	Homogenous productivity	Increasing returns to scale	2nations, many factors

Source: Authors' summary with reference from Melitz (2003); Krugman and Obstfeld (2009) and Feenstra et al (2012).

4.1.2 Regional integration

RTAs involve a group of countries liberalizing their markets for trade and other economic motives (Whalley, 1998; Laird, 2002 and WTO report, 2012). However, it goes beyond trade liberalization alone. It entails security and political dimensions as well as attempts to influence multilateral trade negotiations through collective bargaining (Laird, 2002; Wunderlich, 2007 and WTO Report, 2011). A UNECA Report (2012) surveyed the motivations for the forming RTAs in Africa. The findings suggested that the motives vary from 39% economic, 31% political to 16% geographic, 8% cultural and 6% historical. Furthermore, it could be argued that the current wave of regional integration schemes is a direct response to the failure of global free trade to provide the expected gains from trade. RTAs are generally considered as second-best options in the absence of global free and fair trade (Baldwin, 1993 and Bhagwati and Panagariya, 1996).

As a result, the effect of RTAs in part depends on the extent to which they lead to trade creation or diversion between member states (Viner, 1950; Venables, 1999 and Dunn and Mutti, 2005). There are two aspects of trade creation namely; production and consumption effects. Production effects occur when, as a result of the RTA, production shifts from high-cost domestic producers and the rest of the world to low-cost trading partners. Trade complementarity index is a useful measure of the extent to which the export of country A is matched by imports of partner B in the same product category. Consumption effects occur when, as a result of the RTA, consumption increases due to lower prices of imports. In contrast, trade diversion occurs when production and consumption shift from the low-cost rest of the world suppliers to a high-cost partner due to a preferential reduction in trade barriers (Venables, 1999).

However, the theory of RTAs gives no guidance as to which group of countries should form an RTA. This has generated some debate in the existing literature. Some papers argue that north-south integration schemes are more plausible because of differences in their comparative advantage and could lead to upward convergence of income (Cernat, 2001; Schiff and

Winters, 2003; Venables, 1999 and Lee and Park, 2007). Other papers highlighted that south-south integration is not plausible due to little or no production complementarities, production skewed toward international trade, low manufacturing base and other resource constraints (Aryeetey, 2001; Shams, 2003; De Groot et al, 2003; Geda and Kebret, 2007; Gupta and Yang, 2007 Subramanian and Matthijs, 2007; Turkson, 2010; Alagidede et al, 2012 and UNECA Report, 2013). Some papers point to the view that south-south integration schemes could be plausible if certain policy measures are put in place. For example, research has shown that increasing production of foodstuffs could create trade in the ECOWAS region since food imports tend to be relatively expensive (Cincin-Sain and Marshall, 1983; Blein et al, 2008; Hertzenberg, 2011; Diop, 2012; UNECA Report, 2012; Brenton et al, 2012; Cissokho et al, 2012).

Furthermore, RTAs which allow free factor movements could shift production in some sectors which could put pressure on some economies. The existing literature points to the view that factor movement brings competition and specialization which lead to price and income convergence (Samuelson, 1948; Ben-David, 1996; Mountfort, 1998; Ranjan, 2003 and Zhang, 2006). However, the convergence of income and price could lead to permanent shifts in the economic structures of some RTA members with profound economic consequences. For example, NAFTA resulted in corn prices falling by 48% in Mexico from 1996 to match the other members' corn prices. However, it subsequently led to permanent unemployment of an estimated two million people by 2007 (Weisbrot et al, 2014). Therefore, the success of an integration scheme may not only hinge on trade creation but also on compensation mechanisms for potential losers (Stiglitz, 2013).

Nonetheless, RTAs can be strengthened by additional considerations. The earliest motivations for these additional considerations can be partly attributed to Adam Smith's wealth of nations in which he wrote; "First, every individual endeavour to employ his capital as near home as he can, and consequently as much as he can in the support of domestic industry, provided always that he can thereby obtain the ordinary, or not a great deal less than the ordinary profits of stock" (Smith, 1776 p. 362). Additionally, Adam Smith highlighted that the closeness between Britain and Ireland makes it easy and cheaper to transport cattle by sea. His assertion points to two implications for modern RTAs. First, countries in the same region could gain more wealth by liberalizing their markets with the potential to attract investment within those countries. Secondly, proximity could be associated with lower transaction costs and hence a greater demand for goods. Bhagwati and Panagariya (1996) highlighted that if the marginal cost of imports from neighbouring countries or members of an RTA is lower, then such countries have incentives to eliminate trade barriers with mutual benefits. The importing nation pays a lower price while the exporting nation gains more revenue from increased exports.

In summary, countries choose to liberalize their markets because there may be mutual gains from trade on the basis of differences in comparative advantage and potential economies of scale. Trade theories gave guidance that global free trade is the first best option. In the absence of global free trade, RTAs are the second-best option. However, the effects of RTAs on trade gave no guidelines as to which groups of countries should form an RTA. On this basis, computing the RCA and TCI of member states relative to each other and relative to the rest of the world could determine the plausibility of RTAs or at least inform policy on what could be done in order to exploit gains from trade (Krugman and Obstfeld, 2009 and UNECA Report, 2012). Furthermore, assessing some trade indicators could deepen our understanding of the drivers of liberalization. Table 4.3 summarizes how trade theories could be measured and some indicators that determine the extent to which these theories are applied. For example, the RCA could be used to measure the traditional trade theories of comparative advantage while endowments and trade barriers are indicators that characterized comparative advantage.

Table 4.3 Measurement and basic indicators in understanding trade theory

Trade Theories	Measure and how to identify trade theories	Basic Indicators
Mercantilism	Trade policy	Trade barriers
Comparative Advantage	RCA and trade policy	Labor, capital and land endowments and trade barriers
New Trade Theories	TCI, trade policy	Production complementarity and trade barriers

Source: Authors Compilation

4.2 Contextual literature review

The goal of any RTA is to create trade among its members, although there are other factors which could play a part (Laird, 2002 and WTO Report, 2008). There is an extensive literature on the effects of RTAs on trade. The WTO report (2008) summarized several papers about the gains from trade around the world. The results were mixed and, in some cases, gains from trade depended on the degree of integration.

From a historical perspective, world merchandise trade as a percentage of gross domestic product (GDP) rose from 4.6% in 1870 to 30% in 2014 (WTO Report, 2015). The increase in global trade has corresponded with trade liberalization through the GATT/WTO multilateral trade negotiations as well as a reduction in trade costs due to improvements in communication, transportation, energy, the creation of new tradeable products and rising incomes. The latter part of this period also corresponded with increased WTO membership from 23 in 1948 to 162 in 2015 (Bayoumi, 2011; WTO Report, 2014, p. 7; WTO Facts and Figures). However, in the past few decades, countries are increasing forming RTAs which challenge the multilateral trading system (Stiglitz, 2013). Furthermore, the surge in RTAs could be due to the failure of the multilateral trade negotiations and the low share of global trade among some developing countries, especially those in Africa (Trofimov, 2012 and UNECA Report, 2013).

In 2014, Africa's share of world merchandise export was 3.3%, even though it is the second most populous continent in the world (UNCTADSTAT). Table 4.4 below shows the share of intra-regional exports as a percentage of total exports for selected RTAs. It shows that regional exports in 1995 has been higher than in 2014 for some regions.

Table 4.4 Intra-regional exports by RTA (%)

	1995	**2000**	**2005**	**2008**	**2010**	**2012**	**2014**
EU28	**66**	**68**	**68**	**67**	**65**	**62**	**63**
NAFTA	**46**	**56**	**56**	**49**	**49**	**49**	**50**
APEC	**72**	**73**	**71**	**65**	**67**	**68**	**68**
MERCOSUR	**19**	**18**	**12**	**14**	**15**	**13**	**13**
ASEAN	**25**	**23**	**25**	**25**	**25**	**26**	**25**
Africa	**12**	**9**	**9**	**10**	**14**	**14**	**16**
ECOWAS	**10**	**9**	**10**	**10**	**8**	**8**	**9**

Source: Authors Compilation: Data from UNCTADSTAT: http://unctadstat.unctad.org/wds/TableViewer/tableView.aspx. Note EU28 (European Union); NAFTA (North American Free Trade Agreement); APEC (Asia-Pacific Economic Cooperation); MERCOSUR (Southern Common Market); ASEAN (Association of Southeast Asian Nations) and ECOWAS (Economic Community of West African States).

Furthermore, Table 4.4 shows that Africa and ECOWAS regional trade as a proportion of their total trade has been historically lower compared with other RTAs. A large body of research relating to trade in Africa attributed high tariff and non-tariff barriers to trade as impediments to intra-African trade (Ernest, 1976; Deme, 1995; Sachs and Warner, 1997; Shams, 2003; De Groot et al, 2003; Oxfam, 2004; Turkson, 2010; Geda and Kebret, 2007; Alagidede et al, 2012; Aryeetey, 2001; Lavergne, 1997; Longo and Sekkat, 2004; Masson and Pattillo, 2001 and Gupta and Yang, 2007).

Nonetheless, the decreasing trend in intra-regional trade has not prevented a surge in RTAs or the strengthening of old ones. This has raised a number of questions among trade economists about the desirability of RTAs relative to global free trade. Therefore, this section assesses the pattern of multilateral and regional trade in order to determine the extent to which RTAs have been beneficial.

4.2.0 Pattern of world trade

As discussed earlier, many developing countries in Africa, Asia, and South America were once colonized (Acemoglu et al, 2001). As such, it has been argued that their production structures were skewed toward serving the international markets rather than regional markets thus shaping their comparative advantage (UNECA Report, 2013). Indeed, developing countries have been supplying raw materials for manufacturing in the developed nations for many decades (Mouradian, 1998). However, FDI is also becoming the basis for the interaction between developed and developing nations where developed nation’s firms establish operations in the developing world (World Investment Report, 2015). Nonetheless, world trade has shifted from agriculture to manufacturing in the last century. For example, agriculture accounted for 62.5% of world trade in 1913 while manufacturing accounted for 65% of world trade in 2013 and the developed nations contributed more than fifty percent of manufacturing trade (WTO Report, 2013). Similarly, the developing economies share of world exports was 24% in 1990 compared with 76% for developed and transition economies (UNCTADSTAT). However, it appears that developing countries are catching up with the developed nations in their share of world exports. In 2015, developing economies share of world exports rose to 44%, while that of developed and transition economies declined to 55% (UNCTADSTAT). However, there are regional variations among developing nations as well as factors which may account for the catching up. Table 4.5 shows developing economies share in world exports.

Table 4.5 Developing economies share in World exports

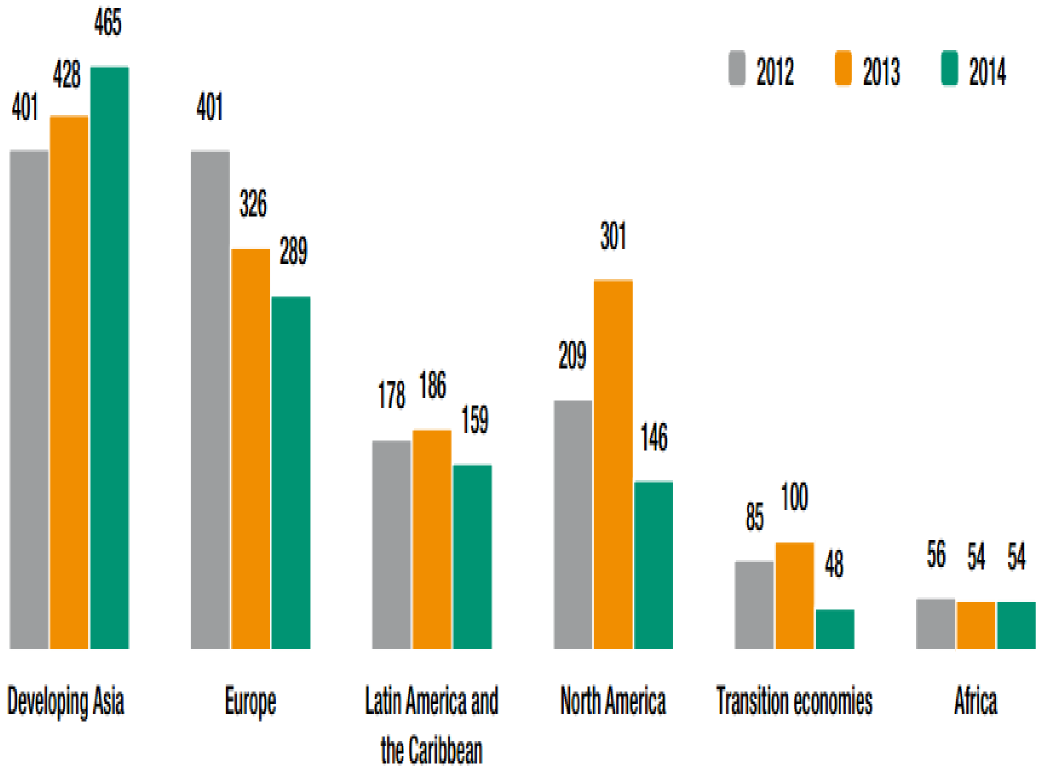
	1980	1990	2000	2010	2015
Africa	6	3	2	3	2
America	5	4	6	6	6
Asia	18	17	24	33	37

Source: Authors Compilation: Data from UNCTADSTAT

Clearly, the increase in the developing nations share in world exports is due to successes made in the Asian continent. Several indicators have been identified in the existing literature about the factors that contributes to the economic and export performance of Asia. They include macroeconomic and political stability, innovation, and foreign direct investment, prioritizing development policy in important sectors, trade liberalization and diversification of the economy (WTO Committee on Trade and Development, 1996; Bayoumi, 2011; Rugwabiza, 2012; Donge Van et al, 2012; Henley et al, 2012 and World Investment Report, 2015). Furthermore, Asia has been able to develop its agro-industry, which has added value to the economy and has diversified into manufacturing (Donge Van et al, 2012).

The direction of FDI provides an indication of the extent to which some regions have progressed in meeting some of the indicators mentioned above. Figure 4.1 shows FDI inflows by region.

Figure 4.1 Foreign direct investment inflows by region (US$ billions)



Source: World Investment Report, 2015

Developing Asia attracted the highest FDI inflows with a positive trend relative to other regions of the world. The WTO Committee on Trade and Development (1996) and Bayoum (2011) argued that there is a direct correlation between FDI, growth in manufacturing and export performance. Uexkull (2012) also argued that most FDI is channeled to export-oriented firms. The pattern of FDI into Asia has also taken the form of offshoring as well as outsourcing, which has partly resulted in export diversification in manufacturing (Donge Van et al, 2012). The attraction of Asia can also be attributed to several factors, including its high relative labor productivity (Faux, 2003 and World Wage Report, 2013). The productivity of labor is an important source of comparative advantage.

In summary, the pattern of world trade has shifted from agriculture to manufacturing in the last century with developed nations dominant.

Similarly, developing nations' share of world trade and intra-developing economies trade as a percentage of their total trade also rose although there are regional variations with Africa lagging. Hence, developing economies could increase their share of world and regional trade if new products are introduced to serve regional markets or certain policy measures are put in place such as reducing the non-tariff barriers. However, as we noted earlier, most of the growth in trade in the developing economies is due to the performance of Asia. Asia's ability to implement policies which led to improvement in macroeconomic stability, trade liberalization, labor productivity and innovation has attracted FDI and diversified their economies and their export sectors. Therefore, a comparative study between Asia and other developing regions like Africa could provide useful policy implications especially the extent to which manufacturing could be exploited.

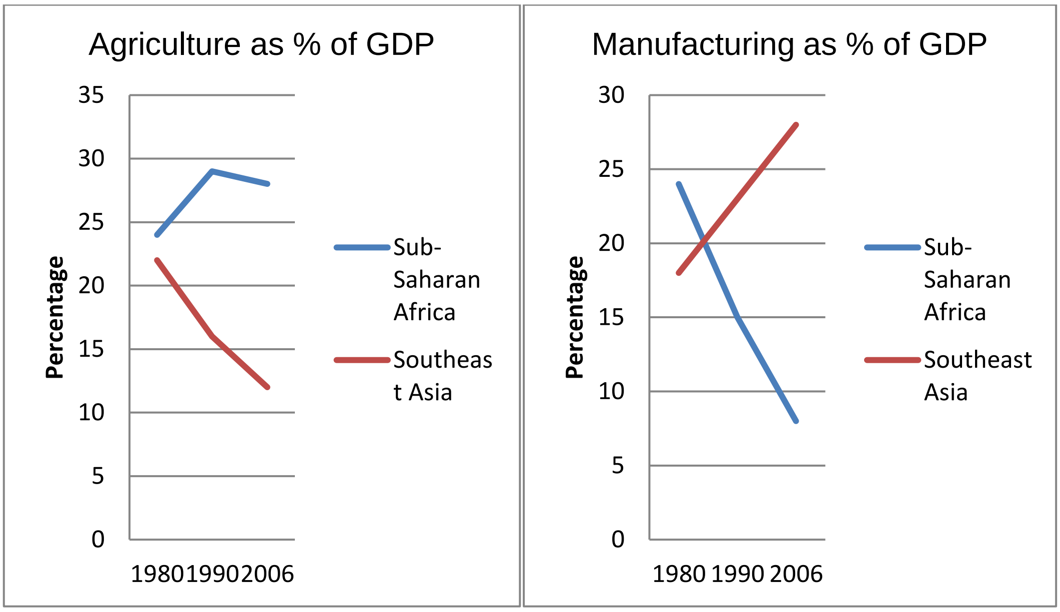
4.2.1 Africa's trade pattern

Africa is home to 15% of the world's seven billion people and contributed 2.8% of the global gross domestic product (GDP) in 2014 (UNCTADSTAT, 2016). Furthermore, Africa's share of world trade was 3.1%, while intra-African exports and imports as a share of their total trade were 16% and 15% in 2014 respectively (WTO International Trade Statistics, 2014 and UNCTADSTAT, 2016). Similarly, Africa depends on a narrow range of primary products for exports. For example, 66% of the continent's exports in 2010 were mining and fuels in contrast to Asia, which has a diversified export sector (Rugwabiza, 2012 and Badiane et al, 2013). This has been reflected by differences in the export diversification index for Southeast Asia at 0.155 while that of Sub-Saharan Africa was 0.402 in 2005[13] (Donge Van et al, 2012). Furthermore, the share of SSA agriculture as a percentage of GDP shows a moderate increase in the 1980s and early 1990s, which is partly attributed to increasing in land use rather than productivity (Blein et al, 2008 and Nin-Pratt et al, 2011). While Southeast Asia's agriculture as a

[13] A higher value means the export sector is less diversified.

percentage of GDP was 16% in 1980 and that of SSA 24%, Donge Van et al (2012) argued that the two regions took divergent path as shown in figure 4.2 below. The manufacturing sector as a percentage of GDP shows that of SSA fell to 8%, while that of Southeast Asia rose to 28% in the periods shown in figure 4.2 (Donge et al, 2012).

Figure 4.2 Comparing composition of GDP for SSA and Southeast Asia

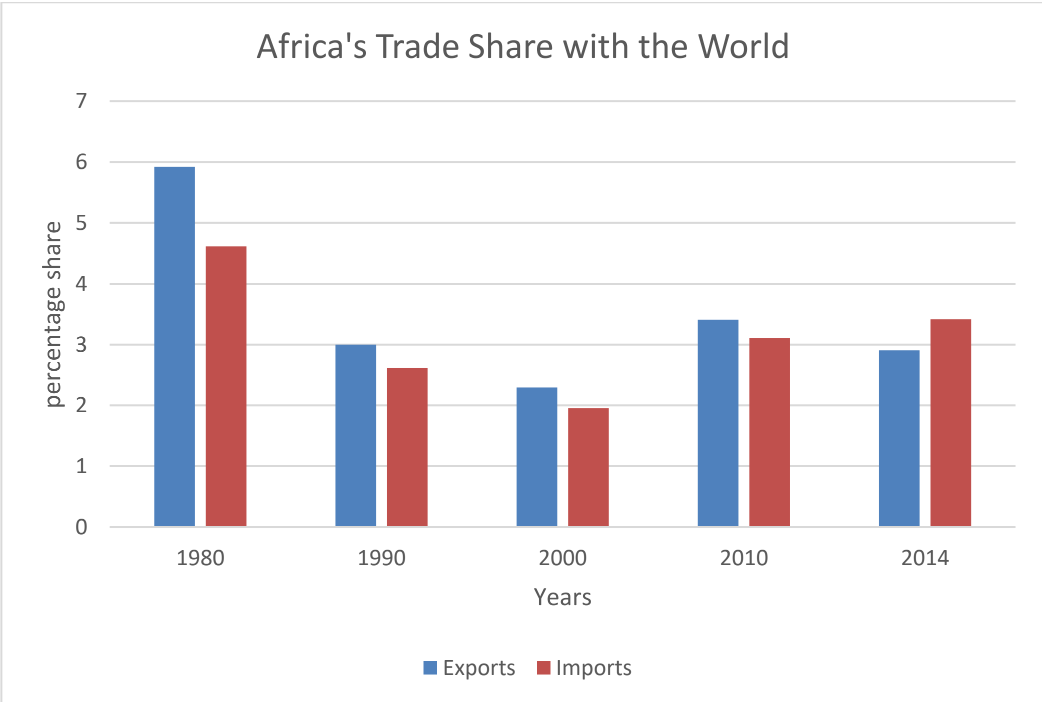


Source: Donge Van et al, 2012

However, more recent data show that SSA agriculture as a percentage of GDP fell from 20% in 2007 to 17% in 2014 while that of Southeast Asia and the Pacific remained stable (World Development Indicators). Manufacturing as a percentage of GDP also remained stable in SSA from 10% in 2006 to 11% in 2014 (World Development Indicators). Furthermore, Southeast Asia's manufacturing as a percentage of GDP is higher than that of SSA which raises a number of policy issues for SSA to reflect upon. First, the region is not exploiting its export potential despite the shift in global trade toward manufacturing (Henley, 2007 and Economic Development in Africa (EDA) report, 2013). Second, the level of production in the region is relatively low which has resulted in import dependence (Hertzenberg, 2011). Third, SSA lost its comparative advantage in some sectors when China joined the WTO in 2001. The World Employment Report (2004) argued that developing countries are increasingly competing among themselves in labour-intensive manufacturing to the same markets. As a result, SSA which has not been able to expand its manufacturing rapidly is likely to face tougher competition from other developing regions for the same markets. Furthermore, WTO (1996) also found a direct correlation between growth in manufacturing and growth in export performance in Asia. Therefore, the low share of African trade in the world should be expected given its low manufacturing base.

Furthermore, Figure 4.3 shows the downward trend in Africa's trade share with the rest of the world from the 1980s and early 2000 before it started improving thereafter although it was relatively low compared with figures in the 1980s. Despite these recent improvements, Africa's trade share in the world is low. In addition to low export diversification, Africa has not been able to attract FDI at the levels of other developing regions like Asia (UNECA Report, 2012 and World Investment Report, 2015).

Figure 4.3 African's trade share with the World



Source: Authors Compilation; Data from UNCTADSTAT

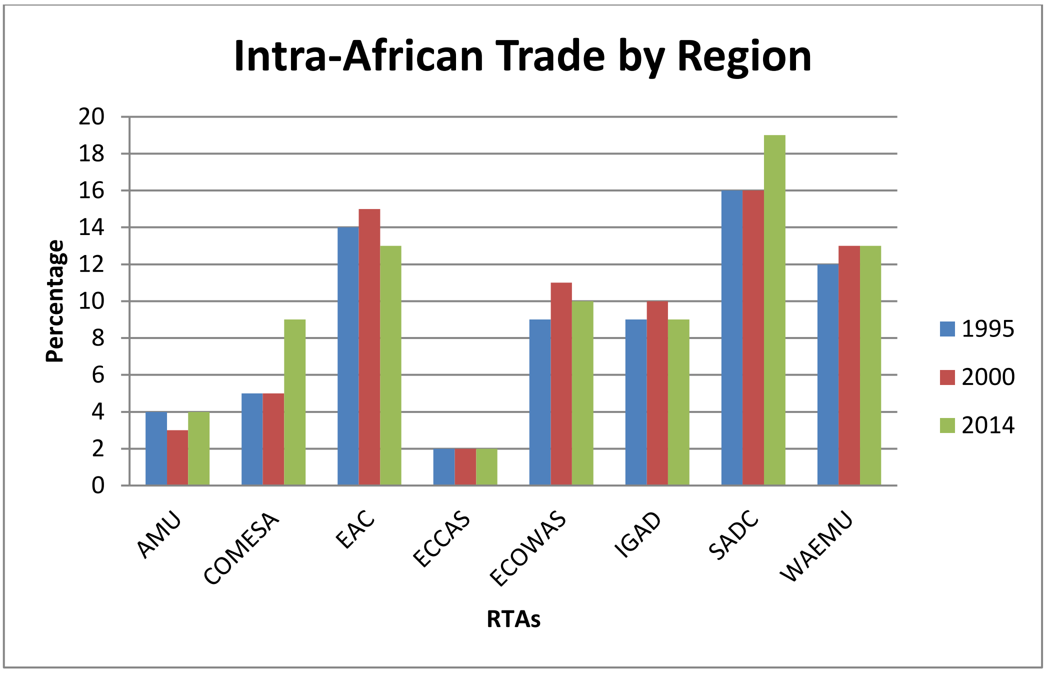
Indeed, Africa's foreign direct investment (FDI) inflows are among the lowest in the world and fell moderately from US$56 billion in 2012 to US$54 billion in 2014. Moreover, 47.4% of FDI in Africa went to only five economies[14] in 2014 which shows the difficulty in attracting foreign capital (World Investment Report, 2015). Asia's success in exports has been largely attributed to the inflow of foreign capital (Henley, 2007; Henley and Donge Van, 2012).

Other papers have found a direct correlation between open economies and growth in GDP and trade (Sachs and Warner, 1997; Inter- American Development Bank, 2000; Rodrik and Subramanian, 2004 and Dijk, 2011). They argued that open economies tend to attract competition and enjoy better institutional quality. Therefore, Africa's trade pattern with the world could not be higher given the region's relatively high tariff and non-tariff barriers as well as their un-competitiveness compared to other regions in selected export products (UNECA Report, 2012). We will seek to compute the comparative advantage of selected products for ECOWAS in order to support this argument.

Turning to intra-African trade, a mixed pattern is visible among the many RTAs in the continent. Hertzenberg (2011) highlighted that the low share of intra-African trade is mainly due to supply constraints; that is, Africa is not producing enough to satisfy domestic and international markets. Figure 4.4 shows intra-African trade as a share of their total trade by RTA, which is low compared with other RTAs in Europe, Asia, and North America. COMESA and SADC were able to increase their intra-regional trade as a percentage of their total trade. However, the other RTAs in SSA experienced a decline or stable intra-regional trade. This suggests the presence of some barriers to trade expansion in the region.

[14] These five economies are South Africa (5.7bn); Congo (5.5bn); Mozambique (4.9bn); Egypt (4.8bn) and Nigeria (4.7bn).

Figure 4.4 Intra-African trade by regional integration scheme (share %)



Source: Authors Compilation; Data from UNCTADSTAT.

Although tariff barriers have generally come down around the world, including Africa, RTAs in Africa face additional challenges in the areas of non-tariff barriers to trade (Page, 2005; Chang, 2010; Keane et al, 2010). These non-tariff barriers take different forms such as quotas, safety standards, and other administrative measures. The non-tariff barriers could also take the form of poor transport and communication infrastructure, non-complementarity of production, non-convertible currencies and lack of political will (Deme, 1995; Sachs and Warner, 1997; Lavergne, 1997; Aryeetey, 2001; Masson and Pattillo, 2001; Shams, 2003; De Groot et al, 2003; Longo and Sekkat, 2004; Gupta and Yang, 2007; Geda and Kebret, 2007; Turkson, 2010; Alagidede et al, 2012; Assane et al, 2014; Sy, 2014 and Mengistu, 2015).

Therefore, Africa is faced with the issue of whether to promote regional integration more than global free trade. Rugwabiza (2012) argued that Africa's future growth lies in its ability to expand and diversify its export as well as increase intra-African trade. Rugwabiza (2012) and UNECA Report (2013) further argued that the low share of intra-African trade could be attributed to the production structures created during colonialism that serves international markets rather than domestic markets. This claim would imply that intra-African trade could increase if the production structure is diversified. However, the colonialism claim about Africa’s poor performance is becoming difficult to maintain given the trade performance of former colonies in Asia. Henley (2012) and Donge Van et al (2012) argued that most of Asia was in similar or poorer economic position than Africa. Therefore, there are other underlying factors which have made Africa unique in terms of its low share of trade with the rest of the world and within the continent. We have identified some of these factors earlier such as macroeconomic and political instability and high tariff barriers. However, Africa is improving on these indicators.

Other non-tariff barriers to trade could be investigated further in order to have an in-depth understanding of the dynamics driving intra-African trade. The hidden costs of cross-border trade, which has had little research attention could be significant. Leyaro and Morrissey (2010) attributed the minimal trade effect on growth to the presence of natural barriers to trade and over dependence on primary product trade. Similarly, Brenton (2012) found that a South African supermarket ‘Shoprite Pty Ltd’ spends an estimated $20,000 a week on arranging unnecessary import permits in order to distribute its goods[15] to stores in Zambia alone due to corruption. Furthermore, the cost of importing and exporting in Africa is relatively expensive (Leyaro and Morrissey, 2010 and Rugwabiza, 2012). Table 4.6 shows the relative costs of shipping a container in Africa and South-East Asia. It costs an estimated US$900 to export a container from South-East Asia to the world in comparison to US$2000 from Africa. It makes Africa less competitive relative to Southeast Asia. Hertzenberg (2011) also estimated that a car shipped from Japan to Abidjan costs US$1500 including insurance while it costs US$5000 from Adidas Ababa to Abidjan.

[15] Goods such as meat, milk and plant crops.

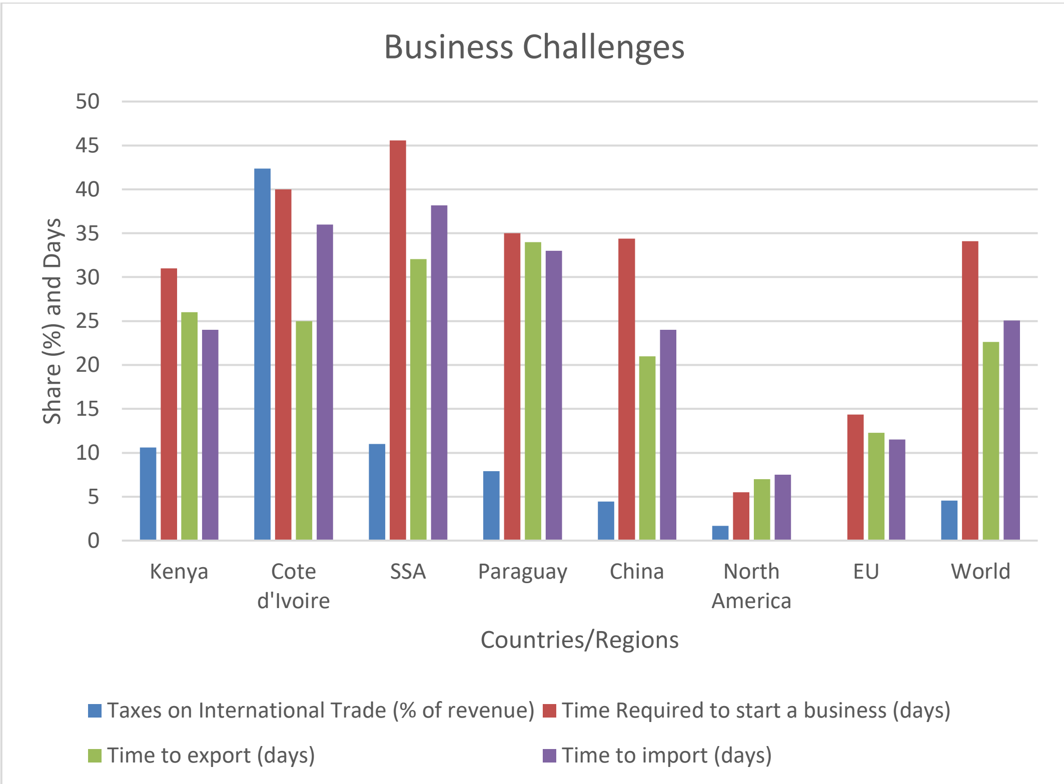
Table 4.6 Costs of a container shipment (Africa and Southeast Asia (US$)

	Importing	**Exporting**
Africa	2500	2000
South East Asia	935	900

Source: Rugwabiza, 2012.

Governments and businesses face additional challenges to trade in SSA. SSA government's dependence on trade taxes is estimated at 11% higher than the world average at 5% in 2014 (Tanzi and Zee, 2000 and World Development Indicators, 2016). Furthermore, Figure 4.5 below shows that it is harder on average to do business in SSA than in other regions of the world.

Figure 4.5 Challenges faced by governments and business



Source: Authors Compilation; Data from World Development Indicators Database

Therefore, although the basis for trade from a theoretical perspective could motivate trade liberalization and regional integration, Africa is faced with high tariff and non-tariff barriers to trade, which distort its trade potentials and contribute to its low share in global trade and to lower intra-African trade. The tariff barriers have generally come down due to the formation of RTAs and the multilateral negotiations through the WTO. However, the range of non-tariff barriers would be tougher to eliminate. Among the non-tariff barriers, the quality of regional trade institutions has had little attention in the existing literature. Most of the research focuses on the role of institutions in facilitating trade. Little research has been done on the determinants of trade institutional quality. Therefore, the main aim of this thesis is to assess the effectiveness and determinants of trade facilitation institutions using ECOWAS as a case study.

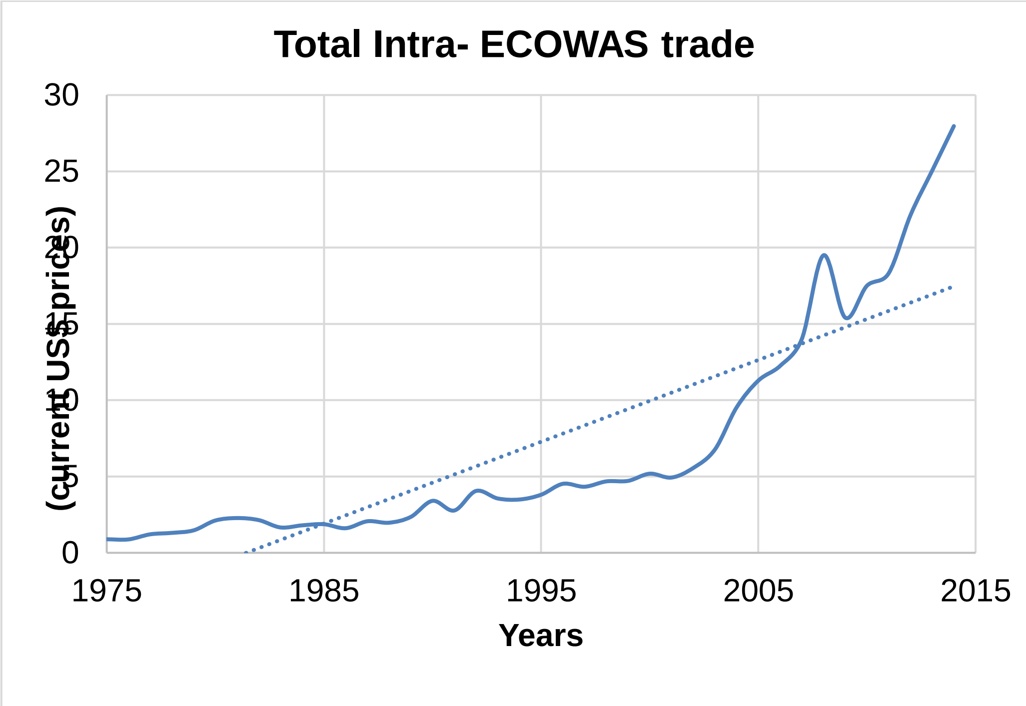
4.3 ECOWAS trade pattern

Our discussion in the previous section shows that intra-African trade, including ECOWAS is low due to the presence of high tariff and non-tariff barriers. The aim of this section is to provide a detailed assessment of intra-ECOWAS trade and with other trade partners by product category. This will precede our next section which measures ECOWAS trade potential in order to demonstrate the extent to which it matches its trade pattern.

Since its formation in 1975, intra-ECOWAS trade rose from US$890 million to $28 billion in 2014 in nominal terms as shown in figure 4.6 (IMF DOTS[16], 2016).

[16] International Monetary Fund Direction of Trade Statistics

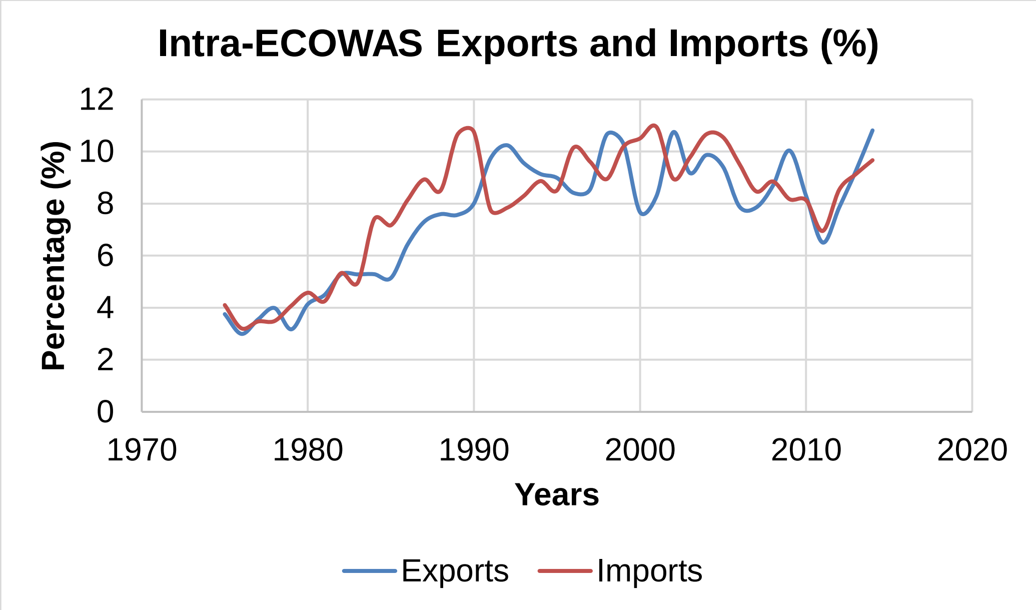
Figure 4.6 Intra-ECOWAS trade in current US$



Source: IMF Direction of trade statistics (Link)

However, the share of intra-ECOWAS trade as a proportion of total trade depicts an initially rising and subsequent flat pattern from 1990 as shown in Figure 4.7. In 1975, intra-ECOWAS trade was 4% of total trade in comparison to 10% in 2014 (UNCTADSTAT). The increase in intra-ECOWAS trade since 1975 could be partly attributed to tariff reduction through ECOWAS liberalization although there is no consensus on this (Aryeetey, 2001; Ogunfolu, 2009; Golub et al, 2009 and Cissokho et al, 2012). Nonetheless, ECOWAS intends to increase intra-ECOWAS trade to 40% by 2030 with a solid industrial structure.

Figure 4.7 Intra- ECOWAS trade as proportion of total trade (%)



Source: Authors Compilation. Data from UNCTADSTAT

Some papers argue that intra-ECOWAS trade would have increased at its current levels regardless of ECOWAS due to the reduction in trade barriers through unilateral and multilateral negotiations while the 40% ambition may not be attainable by 2030 (Meagher, 1997). Nonetheless, the low share of intra-ECOWAS trade as a share of their total trade means there is a potential trade gap (gap between actual and potential trade). This trade gap could be due to several factors. It is argued that unrecorded intra-ECOWAS trade and low production levels, especially in the agricultural sector, could play a part (Deme, 1995; Meagher, 1997; Golub et al, 2009 and Senghor, 2009). Meagher (1997) estimated unrecorded trade in the range of 30 to 50% of official trade and it is mainly channelled through the pre-colonial trade routes. On this basis, the low share of official intra-ECOWAS trade is a consequence of poor recording of trade statistics. Furthermore, this argument also implies that the constraints faced by cross-border traders should be a matter of research interest in order to inform policy. Indeed, Omorogbe (1993) and UNECA (2012) highlighted that the implementation of the ECOWAS trade liberalization scheme is low, and that no country has fully implemented it so far. This point to certain procedural failures which could be synonymous with weak institutions.

In contrast, it is also argued that the current level of intra-ECOWAS trade is expected due to the structures of the economies as well as the stickiness of their trade barriers (Sachs and Warner, 1997; Shams, 2003; De Groot et al, 2003; Turkson, 2010; Geda and Kebret, 2007; Alagidede et al, 2012; Aryeetey, 2001; Lavergne, 1997; Longo and Sekkat, 2004; Masson and Pattillo, 2001; Gupta and Yang, 2007; Blein et al, 2008; and Nin-Pratt et al, 2011). Furthermore, trade theories predict that ECOWAS would trade less among themselves since they tend to produce similar products with a weak manufacturing sector and weak production complementarities. Hence, the low share of intra-ECOWAS trade could suggest that south-south integration schemes are less beneficial (Venables; 1999; Schiff and Winters, 2003 and Lee and Park, 2007). Therefore, an in-depth assessment of intra-ECOWAS trade with its trading partners would improve our understanding of trade patterns in the region in order to inform policy.

4.3.0 Data and measurement of ECOWAS trade pattern

Our analysis will be based on data from the standard international trade classification (SITC 1) of products adopted from UN COMTRADE. SITC 1 classification consists of a long-time series from 1962 which enables us to compute ECOWAS trade patterns and whether ECOWAS created trade since 1975. We will look at all the 10 product categories in SITC 1. These products include;

- Food and live animals
- Beverages and tobacco
- Crude materials, inedible except fuels; mineral fuels, lubricants, and related materials
- Animals and vegetable oils and fats
- Chemicals
- Manufactured goods
- Mineral fuels

- Machinery and transport equipment
- Miscellaneous- furniture and sanitary and
- Commodity- firearms, coin, ammunition, zoo animals etc.

The computation of ECOWAS trade involves measuring the share of trade with selected trade partners over time in equation 4.1 and each product imported and exported as a proportion of total ECOWAS import and export of that product category in equation 4.1a;

$$\mathrm{SHARE} = \left\{\frac{[\mathrm{v_i}]}{[\mathrm{V_j}]}\right\} * 100 \qquad (4.1)$$

$$\mathrm{SHARE} = \left\{\frac{[\mathrm{v_{i,k}}]}{[\mathrm{V_{j,k}}]}\right\} * 100 \qquad (4.1a)$$

Where;

$\mathrm{v_i}$ = value of import or export for region i

$\mathrm{V_j}$ = total import or export of ECOWAS with rest of the World

$\mathrm{v_{i,k}}$ = import or export for region i of product k

$\mathrm{v}_{j,k}$ = total ECOWAS import or export of product k with the rest of the world

Therefore, each row in the tables represents the share of ECOWAS trade with its partners as a proportion of total ECOWAS trade with the WORLD or as a proportion of total for that product category. Table 4.7 contain ECOWAS trade with selected trade partners over time as per equation 4.1. Table 4.8 contain ECOWAS trade by product category as a proportion of total ECOWAS as per equation 4.1a. For example, food and live animal's exports are total ECOWAS food and live animal exports to the world and the share that goes to ECOWAS, EU27, OECD and China only. The values may not necessarily sum up to 100% since only ECOWAS's main trading partners are considered.

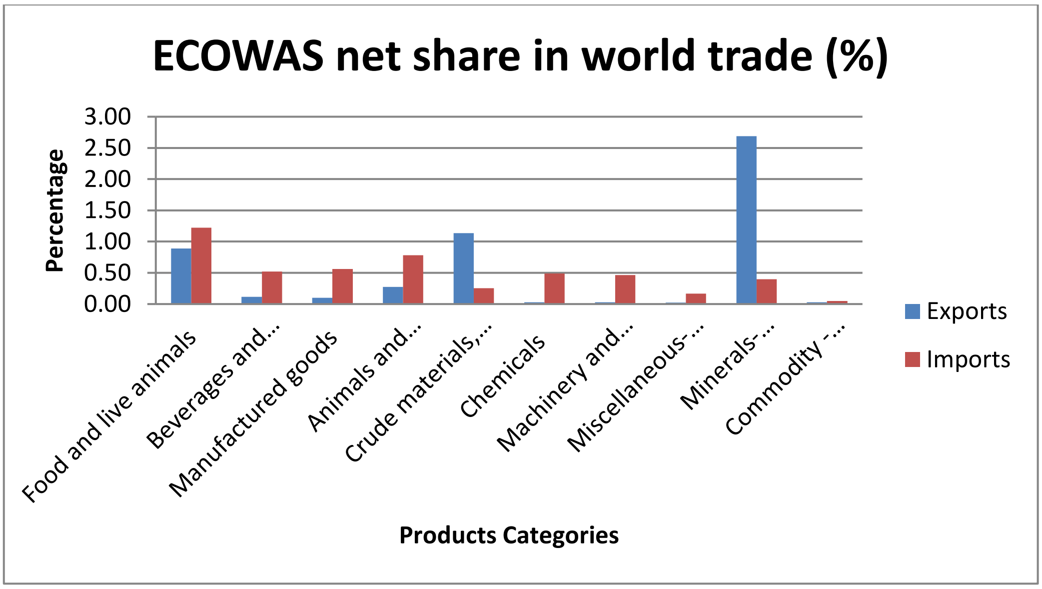
4.3.1 ECOWAS trade pattern by product category

This section looks at the ECOWAS trade pattern by product category. We will specifically look at the ECOWAS net trade share in the world, intra-

ECOWAS trade as a proportion of its world trade and ECOWAS trade as a proportion of GDP and which countries are driving ECOWAS trade and their consequences.

From 2000 to 2010, ECOWAS contribution to world trade was low at 0.5% on average (EDA Report, 2013). Existing papers generally look at the ECOWAS trade share with the world, including intra-ECOWAS trade data. I believe that ECOWAS net trade (total ECOWAS trade to the world minus intra-ECOWAS trade) with the world is a better indicator of its global share. It could inform policy on the extent to which regional markets are exploited while maintaining international markets. Figure 4.8 shows that ECOWAS crude materials and mineral exports contributed 1% or more but less than 3% of total world exports of this product category. Similarly, ECOWAS food and live animals contributed 1% or more but less than 1.5% of total world imports of this product. In essence, the ECOWAS region trade share with the world is low and it is confined to a narrow range of products which is consistent with previous findings.

Figure 4.8 ECOWAS net trade with the world by product category (%) 2013



Source: Authors Calculations; Data from WITS. Notes: Net trade is total ECOWAS trade with the world minus total intra-ECOWAS trade. The share is computed as a proportion of total world trade for each product category. These figures did not include Guinea-Bissau, Liberia, Mali and Sierra Leone as data were not available for intra-ECOWAS trade.

The narrowness of the range of products traded by ECOWAS with the rest of the world is consistent with the general pattern in Africa (Rugwabiza, 2012 and Mwanza, 2015). An estimated 66% to 73% of ECOWAS exports to the world are minerals and fuel related products (Rugwabiza, 2012 and Fundira, 2015). Furthermore, Figure 4.8 shows that ECOWAS has a net trade deficit with the world in all the product categories except crude materials and minerals, which could be due to its resource endowments in these two sectors. The low share of net ECOWAS trade with the world and its trade deficit in most traded products raises a number of questions about what could be done in order to improve its trade share. Moreover, it raises the desirability of its integration scheme in expanding trade in the region.

An in-depth assessment of intra-ECOWAS trade by product category could shed light on the extent to which it could exploit regional markets through deeper integration while maintaining its international markets. We can compute intra-ECOWAS trade as a proportion of its total world trade for each product and intra-ECOWAS trade by product as a proportion of its total world trade. The former gives an indication of how big a product is in total ECOWAS trade of that particular product while the latter gives an indication of the share of a product in total ECOWAS trade. Table 4.7 and 4.8 provide these results. Table 4.7 shows that ECOWAS exports and imports more to (from) the EU27 and OECD as a share of their total exports and imports than any other trade partner. Nonetheless, ECOWAS exports and imports to and from the OECD has been declining while China and India are increasing their trade share with ECOWAS. In contrast, intra-ECOWAS trade share in its total trade has been floating within a 7% to 11% margin from 1996 to 2014. This computation is consistent with previous findings that intra-ECOWAS trade is low (Deme, 1995; Meagher, 1997; Golub et al, 2009 and Senghor, 2009). Hence, the time series data in Table 4.7 demonstrates that intra-ECOWAS trade is not rising enough in order to motivate demand for deeper integration.

Table 4.7 ECOWAS trade by destination as a proportion of their total world X or M

	EXPORTS				IMPORTS			
Year	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	10.52	45.99	76.00	0.21	11.25	48.69	64.07	2.68
1997	12.77	37.83	70.95	0.16	10.78	47.25	63.86	4.64
1998	15.51	39.09	66.52	0.40	9.37	49.52	64.23	3.11
1999	11.64	29.56	60.24	0.85	11.31	48.42	65.79	3.44
2000	9.03	27.30	67.04	0.55	15.79	45.71	60.89	3.82
2001	9.58	30.14	64.93	0.66	13.46	44.87	60.68	4.98
2002	11.69	29.72	59.18	0.45	12.50	41.14	58.61	5.75
2003	9.75	29.60	65.10	0.95	11.48	38.27	55.57	5.83
2006	9.31	25.63	72.15	0.45	9.93	38.43	57.23	10.39
2007	8.73	23.87	66.73	1.55	9.81	37.27	55.08	11.81
2008	10.74	24.67	64.10	0.53	12.44	31.51	46.72	11.75
2009	10.45	27.35	53.23	1.41	6.42	28.44	41.07	14.93
2010	6.54	24.40	59.62	1.68	7.94	26.03	46.46	14.62
2011	9.05	29.63	55.22	2.00	7.23	27.12	49.93	13.71
2012	7.40	35.99	55.91	5.50	10.43	27.10	44.92	16.02
2013	10.75	40.87	54.21	1.84	10.15	31.19	45.28	17.19
2014	8.45	39.60	51.26	1.90	9.20	33.22	48.14	16.82

Source: Authors computation. Data from the World Integrated Trade Solutions (WITS). X= exports and M=imports. Note: The data is total ECOWAS exports or imports as a proportion of ECOWAS world exports and imports. For example, in 1996, 10.52% of total ECOWAS exports went to ECOWAS while 76% of total ECOWAS exports went to the OECD. Likewise, the share of intra-ECOWAS imports as a proportion of its world total imports was 11.25% in 1996 while 64.07% of its total imports originated from the OECD.

A further assessment of the products driving ECOWAS regional and international trade is presented in Table 4.8 and 4.14. Table 4.8 measures ECOWAS trade share as a proportion of its total product level rather than total for all products. It shows that 9.9% of total ECOWAS exports of food and live animal went to ECOWAS members while 3.5% was imported from ECOWAS. This demonstrates that ECOWAS import more from the international markets that drives its import share down. Furthermore, 70% of beverage and tobacco exports as a proportion of total ECOWAS exports of beverage and tobacco went to ECOWAS while 22% imported from ECOWAS in 2014. However, compared with total ECOWAS exports and imports of all products, beverages and tobacco constituted 0.4% and 2.5% respectively in 2013. The other products also show a similar pattern in terms of the proportional share in each product total being relatively higher than its share in total ECOWAS trade with the world. There may be several reasons for this.

There may be an outlier product whose share in intra-ECOWAS trade is low but constituted the majority of ECOWAS exports or imports. Indeed, mineral fuels constituted 74.6% of total ECOWAS exports to the world while only 6.6% of it is exported to ECOWAS as a proportion of its total. Furthermore, the trade imbalances could be due to weak data collection methods and coordination within ECOWAS. For example, while Benin exported US$2. 4 million of food and live animals to Cote D'Ivoire in 2014, Cote D'Ivoire imported US$2.7 million of food and live animals from Benin in 2014 (World Integrated Trade Solutions, WITS, 2016).

Table 4. 8 ECOWAS trade share as a proportion of each products total with selected partners

	EXPORTS						IMPORTS					
Destination	ECOWAS		EU27		OECD		ECOWAS		EU27		OECD	
Product categories	**1996**	**2014**	**1996**	**2014**	**1996**	**2014**	**1996**	**2014**	**1996**	**2014**	**1996**	**2014**
Food and live animals	6.0	9.9	74.9	51.1	83.5	67.6	3.8	3.5	39.6	27.8	53.0	45.9
Beverages and tobacco	54.1	70.3	32.3	1.1	30.0	1.4	4.4	22.4	77.8	44.0	86.2	49.5
Crude materials, inedible except fuels; mineral fuel	21.4	3.7	41.7	33.0	50.5	51.4	18.3	8.3	36.6	26.4	65.7	51.5
Mineral fuels - petroleum, gas, coal	8.2	6.6	38.3	38.1	81.9	49.6	58.6	32.6	17.1	51.4	20.2	54.7
Animals and vegetable oils and fats	23.8	67.7	73.1	15.9	75.7	18.6	16.5	22.0	41.2	4.7	61.1	12.3
Chemicals	33.2	67.7	9.5	8.3	13.9	9.1	5.7	3.2	59.5	31.7	69.9	45.4
Manufactured goods	14.6	29.7	65.5	42.0	68.8	50.5	5.9	4.7	56.7	24.4	66.4	40.5
Machinery and transport equipment	21.4	9.2	33.6	55.8	58.0	59.2	0.4	0.9	56.5	30.9	84.7	53.0
Miscellaneous- furniture and sanitary	30.7	18.3	46.6	58.9	54.1	70.7	2.8	3.4	58.9	25.4	71.3	33.8
Commodity -firearms, zoo animals, coin etc.	31.0	6.8	46.0	71.8	52.4	84.9	1.8	2.2	64.4	36.9	77.3	45.5

Source: Authors Calculation; Data from WITS. Note: The computation represents imports and exports by product as a proportion of total imports and exports for that particular product category only for ECOWAS. Eg, 6% food and life animal's exports in 1996 show that ECOWAS exported only 6% from its members as a proportion of its food and live animal exports.

Nonetheless, the narrowness of the range of products traded by ECOWAS members would require diversification of production and exports. A number of papers argued that ECOWAS trade has potential if production is expanded into new products as well as the removal of non-tariff barriers to trade (USAID, 2011; Hertzenberg, 2011; Diop, 2012; Uexkull, 2012; UNECA Report, 2012; Brenton, 2012 and Olayiwola and Ola-David, 2013). Blein et al (2008); Nin-Pratt et al, (2011) and Brenton et al (2012) are of the view that the poor performance of ECOWAS, in general, may be due to its lack of comparative advantage in a number of products. As such, consumers would prefer low cost foreign to the high cost domestic products from ECOWAS. However, Diop (2012) and UNECA report (2012) argued that foodstuffs from foreign markets are relatively more expensive than those produced within ECOWAS. Hence, it could be that ECOWAS consumer's preferences for foreign goods are relatively higher than their preferences for domestic goods irrespective of cost.

As a result, intra-ECOWAS trade as a percentage of gross domestic product (GDP) could determine the extent to which consumer preferences are shifting from foreign to domestic products. It could also determine the extent to which member states prioritize ECOWAS deep integration ambitions by negotiating to remove trade barriers in order to maximize domestic growth and employment. Table 4.9 shows intra-ECOWAS trade as percentage of GDP for each country. Apart from Liberia, the share of regional trade in each country's GDP has been fluctuating with no clear trend. The share is relatively lower than in other RTAs such as the EU (UNECA report, 2012). Nigeria's regional trade as a percentage of GDP is among the lowest in the region despite being the largest economy in the region in contrast to big economies in other RTAs such as Germany in the European Union and the USA in the North American Free Trade Agreement (NAFTA). The low share of Nigeria's trade to GDP with ECOWAS could be due to differences in demand preferences or that the other economies are too small to supply the Nigerian market. Moreover, only few products accounts for the majority of intra-ECOWAS trade by product category. For example, 78% of total Nigerian exports to ECOWAS were mineral fuels while 90% of total Cote d'Ivoire imports from ECOWAS were mineral fuels in 2014. Hence, the share of intra-ECOWAS trade to GDP ought to be greater if the region is to accelerate the integration process as well as diversify beyond narrow product ranges.

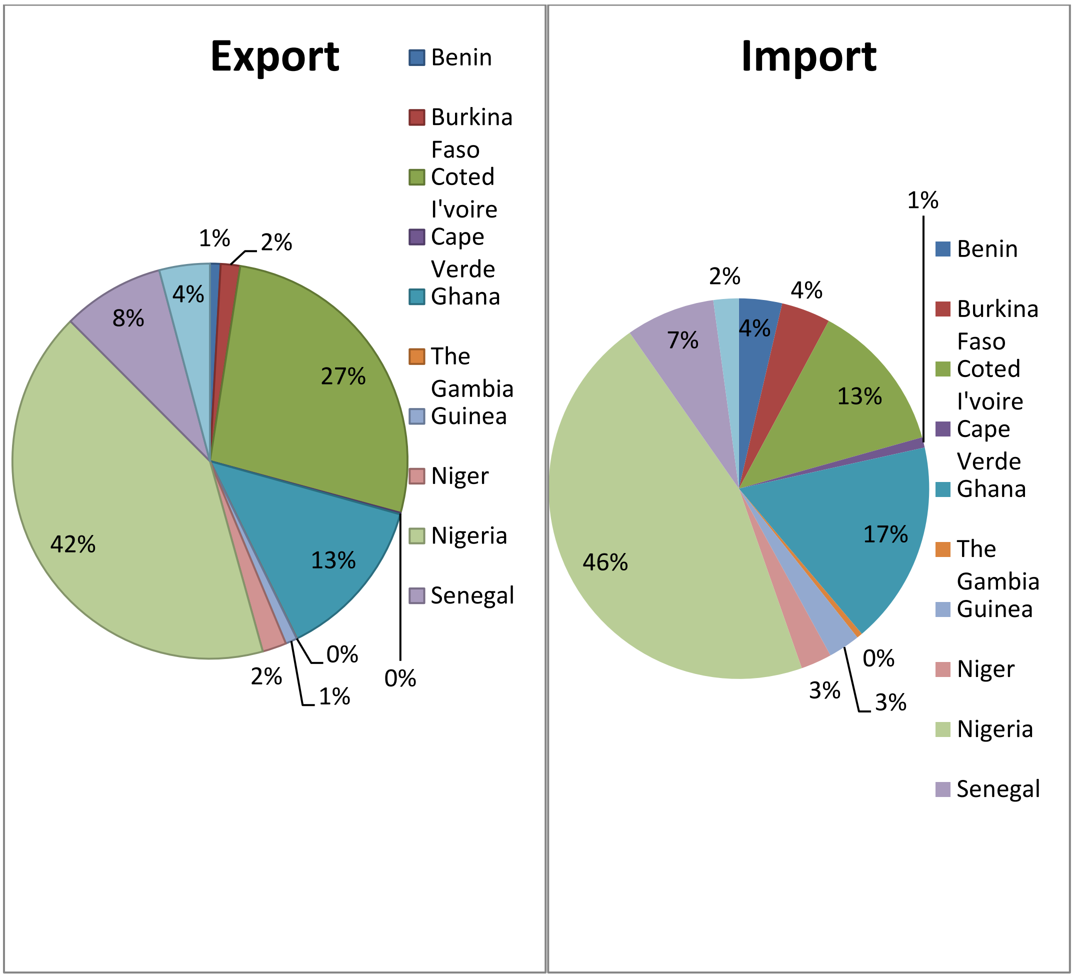
Table 4.9 Regional trade as percentage of GDP in ECOWAS

Countries/Year	1996	2000	2007	2013	2015	% change 2000-2015
Benin	2.12	2.55	6.15	7.01	5.91	178.44
Burkina Faso	7.75	5.22	7.30	12.04	7.34	-5.21
Cape Verde	1.47	0.29	0.53	0.45	0.37	-75.04
Cote D'Ivoire	4.75	7.50	16.45	13.14	9.81	106.74
The Gambia	6.98	5.33	4.73	10.16	9.37	34.17
Ghana	1.35	3.64	4.17	4.33	3.42	154.03
Guinea	4.57	2.73	1.79	1.77	4.58	0.19
Guinea Bissau	-	1.57	2.72	6.67	-	324.05
Liberia	-	-	-	-	-	-
Mali	10.89	7.90	12.33	16.45	13.74	26.24
Niger	9.27	5.71	6.05	11.70	6.82	-26.42
Nigeria	0.54	0.92	1.01	1.65	0.85	59.02
Senegal	4.41	5.67	11.01	13.52	10.08	128.36
Sierra Leone	-	2.82	-	-	15.86	462.89
Togo	7.67	4.88	10.67	19.13	9.08	18.41
ECOWAS trade as a % of GDP	**5.15**	**4.05**	**6.53**	**10.02**	**7.48**	

Source: Authors Calculation: intra-ECOWAS trade data from the World Integrated Trade Solutions (WITS). GDP from the world development indicators in (constant 2010 US$). The GDP data were adjusted into 1000s of US$ in order to align it with the trade data. The Guinea Bissau data presented is for 2003, 2004 and 2005 as the other years were not available. Hence, the percentage change for Guinea Bissau is for 2003 and 2005 while that of Sierra Leone is for 2000 and 2015.

Nonetheless, Nigeria's share in intra-ECOWAS trade as a percentage of total ECOWAS trade is the largest, followed by Cote D'Ivoire, Ghana, and Senegal as shown in Figure 4.9. Indeed, Nigeria constituted 46% of imports and 42% of exports within the region. Diop (2012) and Mwanza (2015) have found identical results using ECOWAS dataset in 2011.

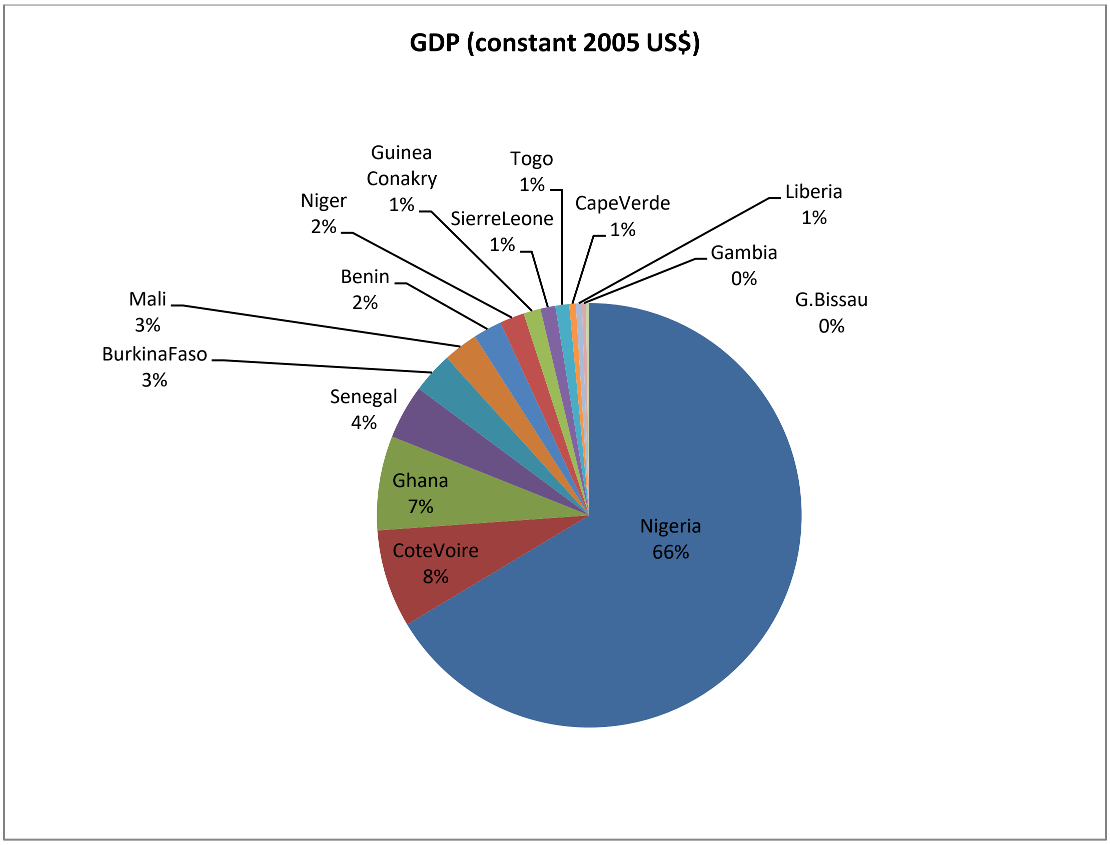
Figure 4.9 Intra-ECOWAS trade by country- % in 2013



Source: Authors Calculations. Data from WITS

Furthermore, Nigeria, Cote D I'voire, Ghana and Senegal constituted 85% of ECOWAS GDP (constant 2005 US$) in 2013 as shown in Figure 4.10. Big economies tend to dominate trade in many RTAs around the world (Brülhart and Thorpe, 2001 and Senghor, 2009).

Figure 4. 10 GDP of ECOWAS members (Share in 2013)



Source: Authors Compilation: Data from World Development Indicators

The dominance of these four countries poses opportunities and threats to the ECOWAS deep integration scheme. The opportunities may arise because big economies could attract imports from small economies provided the comparative advantage of member states or complementarities could be exploited. Gonzalez and Velez (1995) have noted that trade between USA and Mexico is characterized by production complementarity especially among small and medium size firms which has led to growth and employment in both countries. Furthermore, Mexico has received FDI from the USA, especially in the establishment of 'Maquiladora[17]' in Northern Mexico, which created many jobs (Nadal, 2000). However, the similarities in the economic structures of ECOWAS members make regional FDI flows challenging. Ojide (2010) noted that the fear to be dominated by Nigeria among some nations has led to slow integration in addition to high trade barriers imposed by Nigeria. Therefore, the

[17] Maquiladora are firms established in foreign markets specifically aimed at supplying their home country

extent to which big economies like Nigeria attract imports from other members or attract production complementarities could define the success of regional trade.

In summary, we established that intra-ECOWAS trade has been rising as a percentage of its total trade and as a percentage of GDP from 1975. We also demonstrated that the ECOWAS share of global trade is less than 1%, while intra-ECOWAS trade as a share of its total trade averaged 10% in the last decade. Furthermore, the range of products traded by ECOWAS is narrow. An estimated 66% to 74% of ECOWAS exports to the world are minerals and fuel related products (Rugwabiza, 2012; Fundira, 2015 and author’s calculation). Therefore, ECOWAS is faced with the dual challenge in terms of how to increase its trade share in the global and regional markets.

From a theoretical point of view, some papers argue that the current level of ECOWAS trade is expected since they may not have a comparative advantage in a number of products (Brenton, 2012). However, other papers noted that ECOWAS and SSA have comparative advantage in agriculture and foodstuff production (Iyoha, 2005; Senghor, 2009; Uexkull, 2012; Diop, 2012 and EDA report, 2012). Therefore, ECOWAS could exploit its trade potential by increasing production in a range of products especially in agro-industry in the short run although it would require exploiting differences in the comparative advantage of member states or initiation of some form of production complementarity in order to make agro-industry more competitive. Henley et al (2012) noted that Asia’s export performance was partly due to investment in agro-industry in the short run. Dijk (2011) also noted that the low quality of goods produced in SSA usually makes them less competitive in global markets.

Furthermore, some papers highlighted that the high costs of trade in the region (tariff and non-tariff barriers) prevent incentives for investors and traders in the ECOWAS region. Although tariff rates have generally come down, intra-SSA traders pay an estimated 8.7% tariff compared with 2.5% for SSA traders with the global markets (UNECA report, 2012). The non-tariff barriers pose even greater challenges to ECOWAS trade. For example, exporting a container within SSA costs an estimated US$1878. 8 while in East Asia, it is US$902 and US$1229. 9 in Latin America (Dijk, 2011). Williams et al (2006) found that it costs between US$7300 to US$9100 to transport 35 cattle in a truck in most of the Sahelian corridor of ECOWAS due to the poor transport and information and communication network in addition to the bribes paid to customs officials at border points. Furthermore, Diop (2012); Cissokho et al (2012) and Keyser (2012) found that intra-ECOWAS traders pay a lot of bribes estimated between US$100 to US$129 per trip. Similarly, intra-ECOWAS trade barriers in agriculture are higher than other product categories (Fundira, 2015).

Beyond looking at regional trade barriers, Iyoha (2005) argued that an estimated 1.5% of OECD GDP is spent on subsidizing the agricultural sector in addition to high tariff and standards imposed on imported agricultural goods. Hence, OECD can produce surplus agricultural goods at lower distorted-costs which make their exports relatively cheaper in Africa.

Therefore, although ECOWAS has potential to diversify production in a range of products in its trade share, there may still be trade barriers which could prevent trade expansion. In the next section, we assess ECOWAS trade potential before evaluating factors which determine trade barriers in the chapter five.

4.4 Measuring ECOWAS trade potential

The previous sections assessed ECOWAS trade and we established that it is low. It was also highlighted in the existing literature that ECOWAS has potential to expand intra and extra-ECOWAS trade, especially in the agricultural sector while reducing the non-tariff barriers could further enhance this potential. Although there are many indices which measure trade potential, this section focuses on two commonly used indices - revealed comparative advantage (RCA) and trade complementarity indices (TCI) in order to inform policy. We will measure ECOWAS RCA and TCI relative to each other and relative to the rest of the world.

4.4.0 Measuring ECOWAS comparative advantage by sector

RCA measures a country or region's export potential and competitiveness (Siggel, 2006). It was proposed by Balassa (1965) to determine whether the trade pattern of countries was consistent with the traditional trade theory of comparative advantage. Over time, alternative versions of Balassa's RCA index have been proposed (Vollrath, 1991 and Utkulu and Seymen, 2004). Hence, differences in the values of RCA in the existing literature can be attributed to differences in the type of equation and dataset used. RCA has many advantages. It can indicate whether a country can extend and expand its export potential if it has a comparative advantage. It can also generate important information about potential for trade with new partners if time series RCA are computed. However, RCA is static since it measures the stock of trade in a specific period. In addition, economic conditions at home and abroad or changes in trade policy can influence RCA values (Siggel, 2006). Furthermore, RCA does not capture the extent to which government policies such as subsidies could distort the relative costs advantages of trade partners. Reexport trade also pose challenges for ECOWAS regarding the extent to which some trade data is distorted due to statistical duplication.

Nonetheless, a number of papers suggested that ECOWAS members produce similar products; hence less trade should be expected between them unless intra-industry trade is involved. But this does not tell us whether there are differences in their RCA which could stimulate regional trade. As such, computing RCA is a good starting point in highlighting export potential. The simple RCA equation adopted from Utkulu and Seyman (2004) and widely used in research is depicted in equation 4.2;

$$\mathrm{RCA_i} = \left[\left(\frac{\mathrm{X_{i,k}}}{\mathrm{X_{i,t}}}\right)\right] / \left[\left(\frac{\mathrm{X_{j,k}}}{\mathrm{X_{j,t}}}\right)\right] \qquad (4.2)$$

Where

RCA= Revealed comparative advantage of country or region i

$\mathrm{X_{i,k}}$ = Country or region i's exports of commodity k

$X_{i,t}$ = Country or region i's total exports

$\mathrm{X_{j,k}}$ =Country or region j's exports of commodity k

$X_{j,t}$ = Country or region j's total exports

t = time yearly

A value greater than 1 indicates a comparative advantage while a value less than 1 indicates comparative disadvantage. We use equation 4.2 to estimate intra-ECOWAS RCA by product category relative to each other and relative to the rest of the world. This is justified since many of the research papers on West Africa estimates the RCA of the region in relation to its external partners. Their findings suggest that the low levels of intra-ECOWAS trade and trade deficit can be explained by its lack of comparative advantage in a number of products. While this is useful in explaining the export pattern of the region with the rest of the world, it offers little policy implications for intra-ECOWAS trade. Furthermore, existing literature points to the view that similarities in production are not a sufficient condition in explaining the low share of intra-ECOWAS trade. Non-tariff barriers could be important too, while the new trade theories of economies of scale and production complementarities could be exploited.

Therefore, there is a research gap on intra-ECOWAS RCA estimates whose findings could provide better policy implications for the ECOWAS integration scheme. Indeed, Sanguinetti, Siedschlag, and Martincus (2010) found that recent estimates of intra-MERCOSUR RCA reshaped its manufacturing and the subsequent increase in intra-MERCOSUR manufacturing trade. Venables (2003) also argued that specialization can occur because of regional comparative advantage rather than a global comparative advantage. Uexkull (2012) highlighted that intra-ECOWAS comparative advantage is different from the ECOWAS comparative advantage with another regions/world. However, Uexkull (2012) only measured the intensity of exports in increasing employment in the region. Table 4.10 shows the RCA of ECOWAS relative to the rest of the world by product categories.

Table 4.10 ECOWAS RCA by product relative to the rest of the world

Product/year	1996	2000	2005	2010	2013	2014
Food and live animals	2.5	1.5	6.3	1.5	1.5	1.1
Beverages and tobacco	0.1	0.1	1.1	0.5	0.5	0.4
Crude materials, inedible except fuels; mineral fuel	3.6	1.6	5.7	1.2	1.7	1.0
Mineral fuels - petroleum, gas, coal	8.1	7.8	1.4	5.0	4.2	4.9
Animals and vegetable oils and fats	1.3	1.2	2.8	0.5	0.9	0.5
Chemicals	0.2	0.1	0.5	0.1	0.1	0.1
Manufactured goods	0.2	0.1	0.7	0.4	0.2	0.2
Machinery and transport equipment	0.0	0.0	0.2	0.1	0.1	0.1
Miscellaneous- furniture and sanitary	0.0	0.1	0.1	0.1	0.1	0.2
Commodity -firearms, zoo animals, coin etc.	0.1	0.0	1.2	0.0	0.1	0.1

Source: Authors' calculation. Data from WITS.

The results in Table 4.10 are interesting in the sense that they conform to previous findings that ECOWAS has RCA in a number of agricultural products including food and live animals, crude materials and minerals. Furthermore, ECOWAS also has potential to gain RCA in beverages and tobacco and animals and vegetable oils and fats (Deme, 1995; Keane et al, 2010; Uexkull, 2012; Diop, 2012; Brenton, 2012 and Fundira, 2015). However, as shown in Figure 4.8, ECOWAS share in global trade is less than 1%, which raises a number of questions about the extent to which traditional trade theory explains trade patterns as well as why ECOWAS performs poorly in exporting goods for which it has a comparative advantage. Iyoha (2005) is of the view that subsidies by other regions like the OECD could have distorted ECOWAS's comparative advantage in some products. This argument could be plausible. However, ECOWAS is a net importer of some of these products. In 2013, the ECOWAS trade deficit in food and live animals was US$2. 5billion which could not be explained by traditional trade theory (Authors' calculation, Appendix 4A.6). Nonetheless, the trade surplus in crude materials was US$5billion and for minerals were US$69billion in 2013, which could be explained by traditional trade theory. Although ECOWAS trades in a narrow range of products, it should perform better in food and live animal trade. However, as noted earlier, ECOWAS traders faced high trade barriers which could distort their performance in this category (Iyoha, 2005; Diop, 2012; Henley et al, 2012 and Fundira, 2015). We will be assessing some of the factors which account for high trade barriers in ECOWAS in the later chapters.

Furthermore, existing papers have also noted that the future of growth and employment creation in Africa, including ECOWAS countries lies with their ability to promote regional trade (UNECA report, 2012; Rugwabiza, 2012; EDA Report, 2013 and Fundira, 2015). To exploit mutual gains from regional trade, it is plausible to compute intra-ECOWAS RCA by product in order to determine the extent to which regional specialization could be enhanced. Table 4.11 shows intra-ECOWAS RCA by product for each country.

Table 4.11 Intra-ECOWAS RCA by product category and country

	Food & live animals	Beverages & tobacco	Manufactures	Animals & vegetables oils and fats	Mineral	Chemicals	Crude Materials	Machinery	Miscellaneous
Benin	**3.56**	**0.40**	**2.73**	**7.96**	**0.00**	**0.43**	**2.80**	**0.79**	**0.18**
Burkina Faso	**1.85**	**0.29**	**1.66**	**0.52**	**0.71**	**0.39**	**12.37**	**0.62**	**0.18**
Cape Verde	**7.52**	**7.26**	**0.29**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.76**
Cote D'Ivoire	**0.68**	**0.63**	**0.47**	**1.92**	**0.67**	**0.89**	**0.58**	**2.61**	**0.85**
Gambia,	**7.02**	**2.90**	**0.66**	**0.00**	**0.00**	**0.00**	**13.37**	**0.00**	**0.34**
Ghana	**0.79**	**0.00**	**3.00**	**1.33**	**0.06**	**4.78**	**2.91**	**0.57**	**1.36**
Niger	**1.00**	**0.00**	**0.13**	**0.00**	**1.93**	**0.01**	**0.29**	**0.01**	**0.03**
Nigeria	**0.72**	**1.37**	**0.22**	**0.01**	**1.70**	**0.26**	**0.09**	**0.09**	**1.07**
Senegal	**3.54**	**1.68**	**2.93**	**0.15**	**0.31**	**1.17**	**1.84**	**0.34**	**0.57**
Togo	**0.59**	**2.49**	**4.41**	**3.85**	**0.03**	**1.78**	**1.40**	**0.17**	**2.98**

Source: Authors' calculation. Note: F&A=Food and live animals; B&T= Beverages and Tobacco. (Link)

The differences in comparative advantage between ECOWAS members are visible from Table 4.11. Data were not available for Guinea-Bissau, Liberia, Mali and Sierra Leone in 2013. However, previous papers have identified the comparative advantage of these countries with the rest of the world (Ellis and Morgan, 1984; Iyoha, 2005; Hanink and Owusu, 1998; Goretti and Weisfeld, 2008 and Keane et al, 2010). Barry (1998) and Adjao (2011) found that Mali has a comparative advantage in rice production while Ellis and Morgan (1984) found that Liberia has RCA in chemicals and fuels while Sierra Leone has RCA in manufacturing. Hence, ECOWAS could exploit differences in RCA by pursuing a regional specialization in production and distribution strategy.

The smaller economies of Benin, Burkina Faso, Cape Verde, Niger and the Gambia could specialize in the production of food and live animals while Niger and Nigeria specialize in mineral production. Furthermore, Cote d'Ivoire could specialize in machinery production while Ghana, Senegal, and Togo specialize in manufacturing. Table 4.12 summarizes the comparative advantage of ECOWAS countries by product. From a theoretical point of view, allocation of production based on RCA should lead to efficiency of production, which could enhance growth and employment as well as make some products more competitive in the global markets.

Table 4.12 ECOWAS countries with RCA by-product in 2013

Food and Live Animals	Benin, Burkina Faso, Cape Verde, The Gambia, Niger, and Senegal
Beverages and Tobacco	Cape Verde, The Gambia, Nigeria, Senegal, Togo
Manufacturing	Benin, Burkina Faso, Ghana, Senegal, Togo
Animal and Vegetable Oil and Fats	Benin, Cote D'Ivoire, Ghana, Togo
Mineral fuels, lubricants & related materials	Niger and Nigeria
Chemicals	Ghana, Senegal, and Togo
Crude Materials, inedible except fuels	Benin, Burkina Faso, The Gambia, Ghana, Senegal and Togo
Machinery and Transport equipment	Cote D'Ivoire,
Miscellaneous- Furniture and Sanitary etc	Cape Verde, Ghana, Nigeria, and Togo

Source: Authors Compilation (Link)

However, it should be noted that allocation of production among sovereign countries could be difficult without political will. Nonetheless, Okolo (1989) long ago argued that intra-ECOWAS trade can only increase if domestic goods are relatively cheaper than foreign goods since they tend to produce similar products. Hence, we should not expect much from intra-ECOWAS trade given its lack of comparative advantage in a number of products. Hertzenberg (2011) is of the view that Africa is not producing enough to meet domestic demand. Hence, utilizing under-utilized sectors could increase its trade potential in a number of products. Agro-industry could be a first step toward industrialization.

4.4.1 Measuring ECOWAS trade complementarity index (TCI)

The trade complementarity index measures the potential and prospects for intra-regional trade by demonstrating the extent to which the export of country (A) for a particular product matches or complements imports of a partner (B) for that particular product (Musila, 2005; Goretti and Weisfeld, 2008 and Keane et al, 2010). Intuitively, it is the relationship between partner A's export to the world with partner B's imports from the world in the same product category. It is a good measure of intra-regional trade prospects since if partner A exports a lot of product k to the world while partner B also imports a lot of product k from the world, then A can benefit from forming a trade agreement with B. There are many versions of TCI although the final results are identical. In this section, we adopt Goretti and Weisfeld (2008) and the WITS user manual equation (WITS user manual, 2013 p. 19) since that is where our data come from. Symbolically, TCI is computed as in equation 4.3;

$$\mathrm{TCI} = 100 * \left(1 - \left\{\left(\frac{\mathrm{m_{j,k}}}{\mathrm{M_j}}\right) - \left(\frac{\mathrm{x_{i,k}}}{\mathrm{X_i}}\right)\right\}\right) \qquad (4.3)$$

Where

TCI = Trade complementarity index of a country

$\mathrm{m_{j,k}}$ = Partner j import of product k

$\mathrm{M_j}$ = Total import of partner j

$\mathrm{x_{i,k}}$ =export of product k from reporter country or region (ECOWAS) i

$\mathrm{X_i}$ =Total export of reporter country or region (ECOWAS) i

The higher the TCI score and closer to 100 or more, the higher the scope for trade expansion between trading partners or complements one another production (Martijn and Tsangarides, 2006 and Keane et al, 2010). In this section, we assess the TCI for each ECOWAS country by product in relation to one another. Two measures of TCI will be made. The first measure will treat ECOWAS as importer and each member as exporter. The second measure will treat ECOWAS as exporter and each member an importer. The aim of the two measures is to establish the extent to which each member has potential to export to the rest of ECOWAS and ECOWAS has the potential to absorb imports from each member. TCI results should be interpreted cautiously just like RCA results. TCI ignores the impact of transaction and transportation costs on bilateral trade flows. The size differences of the trading partners could also bias the results (WITS user manual, 2013). For example, if product k share in country i total exports is low and product k share in the imports of a partner country is low, converting the difference into percentage will generate a large figure that suggests potential for trade expansion. The discussions in chapter three demonstrated that ECOWAS trade share relative to each other and with the rest of the world is low due to high trade costs and weakness in trade facilitation institutions. Moreover, many ECOWAS countries are characterised by reexport trade that distorts the true value of trade. For example, the Gambia does not produce oil although data suggested that it exported US$5000 worth of mineral fuels to the world all of which went to Guinea Bissau in 2002. Therefore, high TCI scores are useful from a policy point of view although caveats that the presence of high trade barriers could constraint trade flows. Nonetheless, the scores do give an indication of trade potential conditional on further investigation to establish the transmission mechanism.

Results about the ECOWAS TCI in the existing literature are mixed. Some papers noted that the absence of production complementarity in the ECOWAS region makes intra-ECOWAS trade less feasible than north-south trade (Aryeetey, 2001; Sako, 2006; Chete, 2009 and Eggoh and Acclassato, 2013 and Acclassato, 2013). In contrast, the presence of production complementarity between ECOWAS members was found by other papers (Hanink and Owusu, 1998; Goretti and Weisfeld, 2008 and Keane et al, 2010).

Differences in TCI estimates may be due to the use of different data sets. Hence, our estimate of TCI will complement previous findings. The data are based on SITC 1 since it is the only classification that is consistently used by all ECOWAS members and has a longer time series. Table 4.13 shows the TCI results for 11 ECOWAS members by product. We compute the extent to which an ECOWAS member's export is matched by demand from ECOWAS and the extent to which an ECOWAS member's import are matched by ECOWAS exports for each product category.

Table 4.13 ECOWAS members trade complementarity index by product (2013)

Country imports as base and ECOWAS as exporter									
Country/Products	Food and live animals	Animal and Veg fats and oil	Beverages and tobacco	Chemicals	Crude materials	Machinery	Manufactures	Minerals fuels and lubricants	Miscellaneous
Benin	**65**	**97**	**100**	**95**	**97**	**81**	**87**	**91**	**98**
Burkina Faso	**92**	**99**	**99**	**87**	**99**	**76**	**85**	**79**	**96**
Cape Verde	**74**	**98**	**97**	**95**	**99**	**85**	**86**	**84**	**93**
Cote D'Ivoire	**89**	**100**	**99**	**91**	**99**	**65**	**92**	**79**	**98**
Gambia, The	**70**	**95**	**99**	**97**	**99**	**85**	**90**	**81**	**95**
Ghana	**86**	**99**	**99**	**88**	**99**	**62**	**83**	**101**	**94**
Guinea	**83**	**99**	**98**	**92**	**99**	**81**	**89**	**74**	**95**
Niger	**75**	**97**	**97**	**91**	**96**	**75**	**85**	**100**	**96**
Nigeria	**88**	**100**	**97**	**89**	**97**	**72**	**87**	**85**	**98**
Senegal	**81**	**98**	**99**	**91**	**98**	**82**	**90**	**75**	**97**
Togo	**90**	**98**	**99**	**84**	**99**	**82**	**80**	**83**	**96**
The country exports as a base and ECOWAS imports									
Benin	**92**	**103**	**98**	**89**	**98**	**72**	**92**	**81**	**97**
Burkina Faso	**90**	**99**	**98**	**89**	**103**	**72**	**91**	**90**	**97**
Cape Verde	**85**	**99**	**98**	**89**	**98**	**70**	**86**	**81**	**96**
Cote D'Ivoire	**87**	**101**	**98**	**91**	**98**	**84**	**88**	**91**	**98**
Gambia, The	**87**	**0**	**98**	**88**	**98**	**70**	**86**	**0**	**96**
Ghana	**86**	**99**	**98**	**94**	**98**	**71**	**91**	**81**	**97**
Guinea	**86**	**99**	**98**	**89**	**98**	**71**	**86**	**81**	**99**
Niger	**88**	**99**	**98**	**89**	**98**	**70**	**87**	**112**	**96**
Nigeria	**85**	**99**	**98**	**89**	**98**	**70**	**86**	**85**	**97**
Senegal	**100**	**99**	**100**	**93**	**99**	**71**	**99**	**87**	**98**
Togo	**89**	**105**	**102**	**98**	**99**	**71**	**115**	**81**	**106**

Source: Authors' calculation.

The results in Table 4.13 partly confirm the RCA findings that ECOWAS members have potential to expand intra-regional exports for selected products. Furthermore, our findings are consistent with others that ECOWAS countries could complement each other's production (Hanink and Owusu, 1998; Musila, 2005; Goretti and Weisfeld, 2008 and Keane et al, 2010 and Adjao, 2011). The table shows that each country could be an exporter and importer or complement each other production in the region. The artificial borders demonstrate that it is possible to be an exporter and importer of the same product within ECOWAS. For example, some large towns and cities are closer to producers from neighbouring countries than some of their own producers. Hence, high transportation costs associated with distance attracts imports from a near neighbour (Keyser et al, 2012).

In summary, the computed RCA and TCI show potential for the ECOWAS integration scheme if a number of measures are taken to allocate production on the basis of RCA while exploiting TCI. However, intra-ECOWAS trade has been historically low which raises a number of policy challenges and the extent to which their model of integration is driven by trade theories. In 2014, mineral fuels accounted for 79.4% of total ECOWAS exports and only 5.2% of it was intra-ECOWAS exports. Other products such as food and live animals, crude materials and animal and vegetable oils and fats also account for a small share in total ECOWAS exports and intra-ECOWAS exports as shown in table 4.14 below. Nonetheless, ECOWAS does have RCA in these mention product categories relative to the rest of the world while the TCI demonstrated that it is feasible to expand regional trade in the region. Therefore, using RCA and TCI could be a weak measure of trade potential if other stimulus of trade such as institutional quality is ignored. Balassa (1965) argued that the success of integration could depend on the economic sizes which stimulates demand, production levels and the removal of trade barriers. Hertzenberg (2011) also found that Africa production levels are very low while regional trade costs are relatively high. Therefore, although ECOWAS has RCA in selected products such as mineral fuels, food and live animals and crude materials and the potential to expand regional trade as demonstrated by the TCI, there are many challenges to overcome, including the cost associated with cross border trade and small economic sizes. Hence, ECOWAS should prioritise removing the high cost associated with cross border trade through various measures. Part of this was discussed in chapter three and will do so in chapter six.

Table 4.14 Share of each product in total ECOWAS exports

	% Distribution					%share to ECOWAS				
	1996	2000	2011	2013	2014	1996	2000	2011	2013	2014
Food and live animals	18.4	8.0	7.2	9.3	7.0	1.1	0.8	0.8	1.0	0.7
Beverages and tobacco	0.1	0.1	0.3	0.4	0.3	0.1	0.1	0.2	0.3	0.2
Crude materials, inedible except fuels; mineral fuel	13.4	4.9	7.9	7.0	4.0	2.9	0.8	0.2	0.2	0.1
Mineral fuels - petroleum, gas, coal	61.8	82.5	79.1	74.6	79.4	5.1	5.5	5.7	4.9	5.2
Animals and vegetable oils and fats	0.6	0.4	0.3	0.5	0.3	0.1	0.1	0.2	0.3	0.2
Chemicals	1.8	1.0	1.1	1.3	0.8	0.6	0.5	0.6	0.8	0.5
Manufactured goods	2.8	1.9	2.1	2.9	2.5	0.4	0.7	0.9	1.1	0.7
Machinery and transport equipment	0.5	0.4	1.3	2.9	3.4	0.1	0.1	0.2	1.6	0.3
Miscellaneous- furniture and sanitary	0.4	0.7	0.5	1.0	2.1	0.0	0.0	0.0	0.0	0.0

Source: Authors Calculation. The data measures the share of each product in total ECOWAS exports to the world in the first five (5) column 1996 to 2014. The last five columns look at the share of intra-ECOWAS export by product as a proportion of total ECOWAS export to the world. Eg. 1996, 18.4% of total ECOWAS export was food and live animal and only 1.1% was intra-ECOWAS.

Furthermore, ECOWAS could exploit production complementarity in order to expand production especially in sectors that are still underutilised. We look at some of these indicators in the next section in order to assess the extent to which they could complement ECOWAS trade potential.

4.5 ECOWAS population, economic and land size

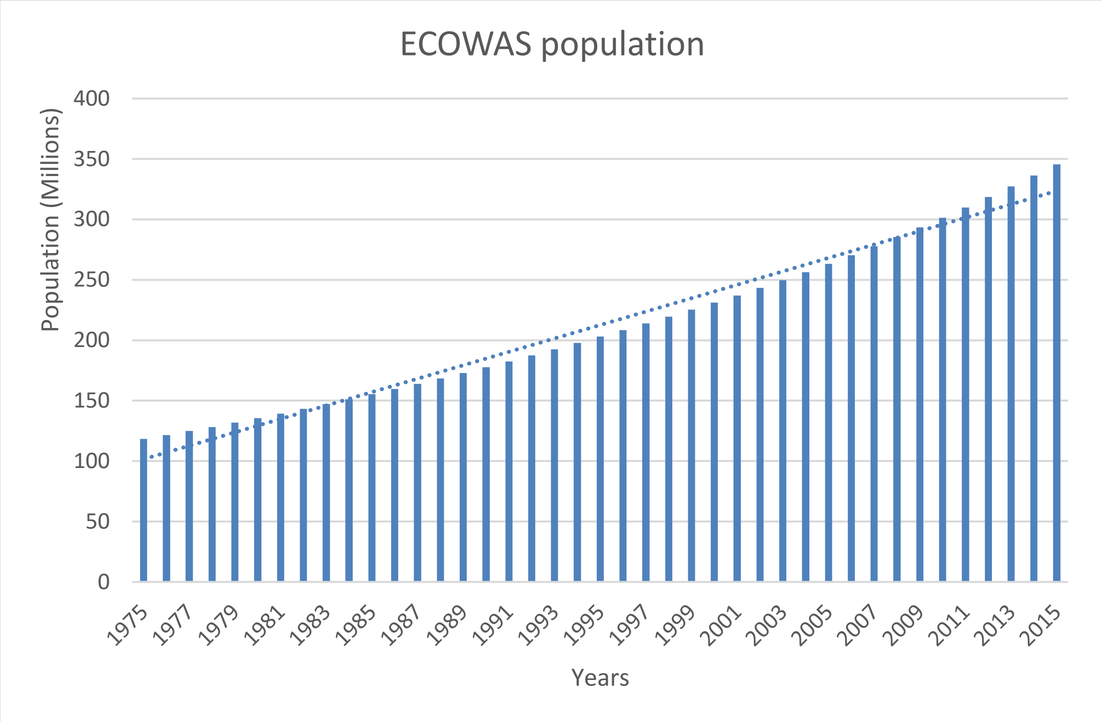
We demonstrated in the previous sections that although ECOWAS has potential to expand regional trade by exploiting regional RCA and production complementarity, the share of intra-ECOWAS trade in its total trade is low. This suggests that there are fundamental issues which prevent ECOWAS from exploiting its trade potential. Several approaches could be used to assess the extent to which these issues affect ECOWAS trade potential such as the gravity model of international trade or a descriptive content analysis. The gravity model allows the inclusion of several variables that measures the degree of relationship between some variables and trade flows. Furthermore, the gravity model is a good measure of trade theory. However, our focus in this thesis is to assess the factors which determine barriers to intra-ECOWAS trade with specific reference to institutional quality that has not been sufficiently investigated. Several papers have estimated determinants of bilateral trade flows (Deardoff, 1998; Aryeetey, 2001; Shams, 2003; Fafchamps, 2004; Anderson and Wincoop, 2004; Djankov et al, 2010; Rodrik, 2007; Turkson, 2010; Stefanadis, 2010; Sousa, 2012; Salvatici, 2013 and Assane et al, 2014). The aim of this section is to discuss how key variables in the gravity model such as population, economic size and distance (trade costs) could contribute to intra-ECOWAS trade expansion.

The population of ECOWAS grew from 118.4 million in 1975 to 345.7 million in 2015 as depicted in figure 4.11[18] (UNCTADSTAT and Bonnal, 2007). This makes ECOWAS the 7th most populous RTA in the world and it is projected to

[18] Note; the 1975 population excluded Cape Verde but included Mauritania. The 2015 figure included Cape Verde and excluded Mauritania since Mauritania left in 2000.

be the 4th most populous by 2050 if current population growth trends continue (UNCTADSTAT). However, the population varies among ECOWAS members.

Figure 4.11 Population of ECOWAS (1975- 2015)



Source: UNCTADSTAT

Table 4.15 shows that Nigeria accounts for over half of the total ECOWAS population and is projected to continue to do so in the future. The population could provide opportunities and threats to RTAs. A number of papers argue that higher population could stimulate greater demand for goods and services consequently leading to more growth and trade, especially if the population is active in a market economy (Teunissen, 1996; Adjao, 2011; Nin-Pratt et al, 2011 and Africa Report, 2015). Hence, the formation of RTAs allows producers to exploit access to a larger market while consumers also access a variety of goods and services. Intra-African RTA trade has increased with population growth. For example, the population of ECOWAS grew 192% between 1975 and 2015 while intra-ECOWAS trade grew 200% in the same period (Authors' calculation; UNCTADSTAT data). Other papers argue that the correlation between population and regional trade depends on the convergence of demand preferences between trading partners. That is if production of goods and services in country ‘A’ is not matched by huge demand from country ‘B’, population growth in country ‘B’ may not have significant trade effects for country ‘A’ (Linder, 1961 and Ruffin, 1988).

Table 4.15 Country population as proportion of total ECOWAS population (%)

Country/ years	1975	2015	2030	2050
Benin	2.76	3.15	3.04	2.74
Burkina Faso	5.20	5.18	5.21	5.07
Cape Verde	0.26	0.15	0.11	0.08
Côte D'Ivoire	5.58	6.16	5.73	5.25
The Gambia	0.44	0.57	0.60	0.60
Ghana	8.30	7.81	6.91	5.66
Guinea	3.67	3.57	3.40	3.03
Guinea-Bissau	0.66	0.52	0.48	0.43
Liberia	1.38	1.30	1.25	1.16
Mali	5.23	4.70	5.10	5.60
Niger	4.28	5.57	6.77	8.61
Nigeria	53.68	53.09	53.55	54.59
Senegal	4.14	4.33	4.29	4.08
Sierra Leone	2.38	1.83	1.58	1.28
Togo	2.04	2.07	1.96	1.80
TTL-ECOWAS	118.41	345.70	509.98	806.63

Source: UNCTADSTAT: Percentage calculated by Author. Note 2030 and 2050 are projections.

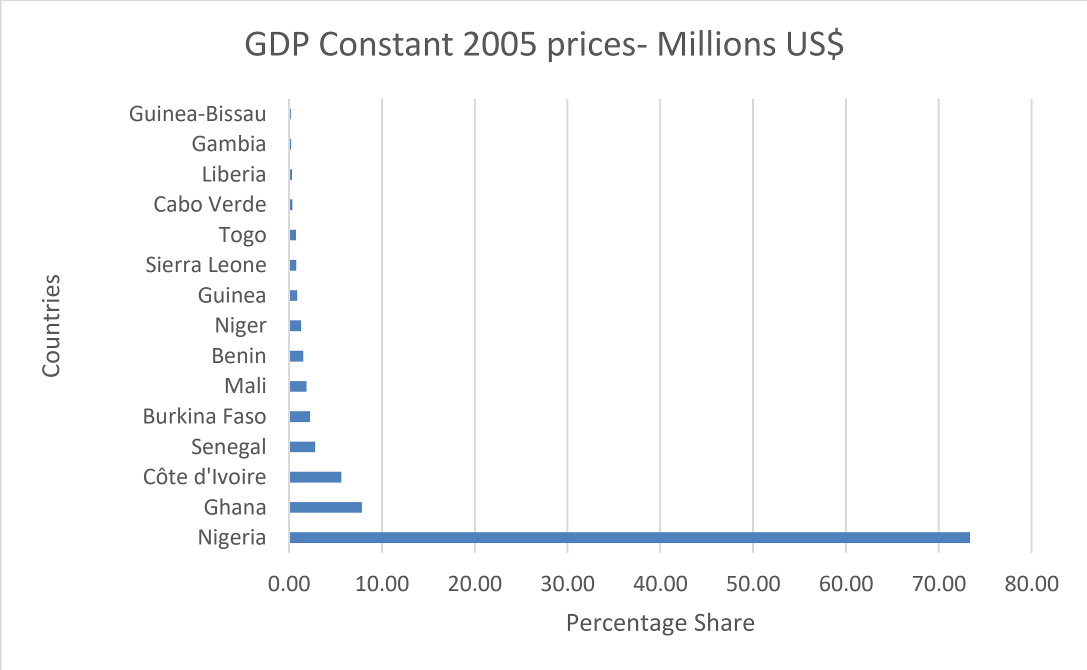
Our TCI estimates suggest that ECOWAS could exploit the size of its population in order to stimulate trade by pulling them into the formal economy, especially in the big economies like Nigeria, Cote d’Ivoire, Ghana, and Senegal.

However, the skewness of population, production, and trade towards big countries could have macroeconomic implications for small economies.

Indeed, global evidence suggests that big economies perform better in RTAs. Negative macroeconomic implications in small nations could create dislike for ECOWAS, which has the potential to lead to future regional conflict if the citizenry put the blame on their governments. Given the history of ECOWAS as a conflict prone region, these macroeconomic implications could be prioritized before a fully- fledged integration scheme. Indeed, Stiglitz (2013) argued that there will always be winners and losers in any RTA. As such, how to compensate losers must be established. The ECOWAS fund could facilitate compensation, although Ekpe (2015) argued that the implementation of compensation has not been successful. In the absence of compensation, ECOWAS could endeavor to allocate production on the basis of comparative advantage in order to widen the gains from trade. Krugman and Obstfeld (2009) proposed similar strategies for the lesser economies in the European Union. Our measure of RCA and TCI suggest the feasibility of allocating production within ECOWAS.

Furthermore, economic size could stimulate trade if the increase in per capita income corresponds to increase in the demand preference for regionally produced goods. Indeed, economic theory and the gravity model of trade postulates the importance of income in determining trade. Therefore, differences in the economic sizes of ECOWAS members could determine their export and import potential. Figure 4.12 shows the GDP of ECOWAS members in 2014. Nigeria accounted for an estimated 73% of ECOWAS GDP followed by Ghana, Cote D'Ivoire, Senegal and Burkina Faso. The big economies may need to demand more imports from other ECOWAS members in order to boost production and trade. In the absence of that, smaller economies could receive compensation for economic loss due to ECOWAS integration.

Figure 4.12 ECOWAS GDP by Country in 2014



Source: Authors Compilation: Data from UNCTADSTAT

Furthermore, boosting regional trade may require narrowing the gap between actual production and potential production, especially in the agriculture sector in the short run since agriculture contributes to an estimated 60% of employment and 35% of GDP on average in West Africa (Senghor, 2009 and World Development Indicators, 2016). Prioritizing agriculture would require expansion of production and productivity and could define success in ECOWAS (Blein et al, 2008; Cissokho et al, 2012 and Jalloh et al, 2013). Furthermore, our estimates suggest that ECOWAS has RCA in the production of agricultural goods relative to the rest of the world.

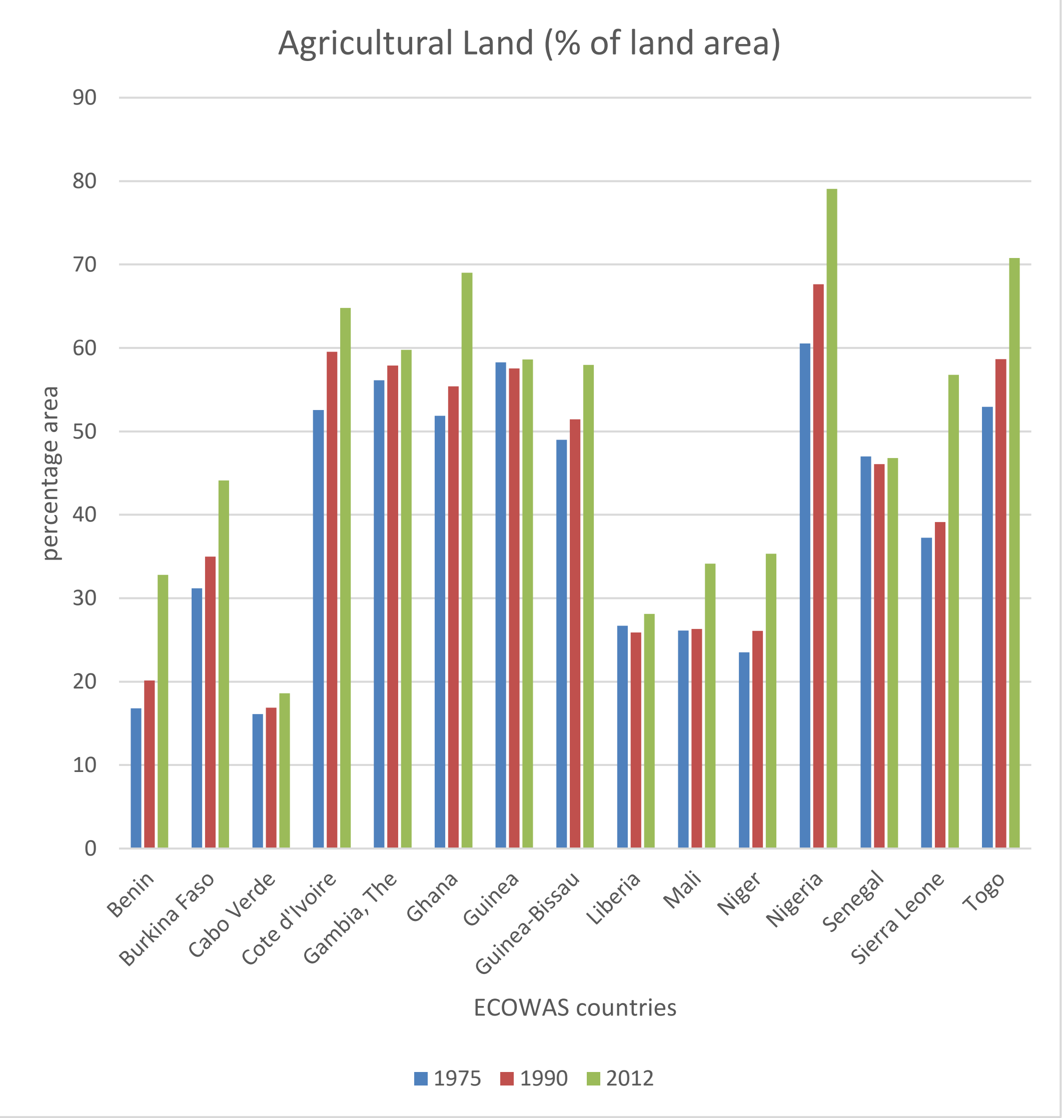
The land area of the 15-member states of ECOWAS offers potential for agricultural production and complementarity. The land area is approximately 5,032,970 km. sq or (1,943,241 sq. miles) which is 17% of Africa's total land area (World Development Indicators, 2016). The average land used for agricultural purposes for all ECOWAS members in 2012 was about 50% of the total arable land area which is equivalent to 125,824,855[19] hectares (World Development Indicators, 2016).

However, for countries where data are available, the percentage of land that is under irrigation is low in the ECOWAS region. In 2004, Cape Verde agricultural land under irrigation was only 4.7%, while that of Ghana was 0.19% in 2010; Senegal 0.73% in 2006 and Niger 0.22% in 2011 (World Development Indicators, 2016). Hence, mechanized farming or the green revolution has not taken off rapidly in West Africa, and it could contribute to more production and poverty reduction (Dillon, 2011 and Tucker, 2016). Similarly, the Diamma and Manantali dam constructed at a cost of US$700 million in 1987 had the potential to irrigate about 430000 hectares in parts of Mauritania, Mali and Senegal but only 118000 are being utilized (ECA Report, 2000). In SSA, only 4% of agricultural land is irrigated compared with 29% in East and South-East Asia and 41% in South Asia (Senghor, 2009 and Dijk, 2011). The excessive reliance on rain water alone is not sufficient to trigger agricultural production and productivity that can increase harvests. Indeed, it is difficult if not impossible to integrate hungry people.

Figure 4.13 depicts changes in the percentage of land used for agriculture in individual ECOWAS member states since 1975. It shows that land use for agriculture has steadily increased in all the countries. However, the expected yields have not increased significantly. For example, yields in values from 1990 to 2013 for about 100 agricultural products grew by 0.72% annually on average. The Food and Agricultural Organization (FAO) highlighted that West Africa can improve yields if certain measures are taken such as an increase in the use of fertilizers.

[19] 1 sq. mile=259 hectares; 1,943,241 sq.m=251,649,710 hectares. Therefore, $\frac{251{,}649{,}710 \text{ hectares}}{2} = 125{,}824{,}855$

Figure 4.13 Changes in Agricultural Land usage from 1975-2012 in ECOWAS



Data Source: Authors Compilation. Data from World Development Indicators Database. Note: Agricultural land is the share of land that is arable and under permanent crops such as fruit trees and use for pastures. So, it excludes forest and land used for wood and timber.

Nonetheless, an increase in the use of land for agriculture is attributed to several factors such as population increase and decline in crop yields due to soil infertility (Nin-Pratt et al, 2011; Hertzenberg, 2011 and ECOWAS Sector Agriculture, 2015). Therefore, the increase in land used for agriculture is not directly related to increase in consumption within ECOWAS or increase in demand for ECOWAS agricultural goods in the rest of the world. Instead, rising population and low yields accounted for the increase in land under cultivation. Therefore, there is a need to improve productivity in order to enhance food security and fight hunger.

To sum up, ECOWAS has the potential to be a successful regional integration scheme. It has a rising population and economy, which could stimulate demand for goods and services. Furthermore, it could increase crop yields by increasing the use of arable land, irrigation as well as fertilizers. Such measures have the potential to increase agricultural production and productivity, which could increase intra-ECOWAS trade given its RCA in agriculture.

4.6 Chapter summary and conclusions

The aim of this chapter was to assess the degree of intra-ECOWAS trade and its trade potential as well as the dynamics driving regional integration. Our assessment generally shows that intra-ECOWAS trade is low relative to each other and relative to the rest of the world. However, the low share of intra-ECOWAS trade is similar to trade in other RTAs in the developing world especially those in Africa. As such, the debate continues as to the extent to which south-south integration schemes are better than north-south integration schemes. Arguments in favor of north-south integration noted that the south could learn best practices from the north (Winters, 1996 and WTO Report, 2011). Furthermore, many RTAs in the developing world, especially in Africa, tend to produce similar products mainly in the primary sectors which are vulnerable to price shocks (UNECA report, 2012 and EDA report, 2013). Hence, north-south integration is more desirable (Venables, 2003).

Nevertheless, our analysis shows that intra-ECOWAS trade in similar products exists and demonstrates the dynamics of regional trade beyond the simple law of comparative advantage. For example, Benin exported US$ 179 thousand of food and live animals to Senegal while it imported US$ 920 thousand food and live animals from Senegal. Similarly, intra-ECOWAS trade in similar goods is mainly channelled through the pre-colonial trade routes which transcend the current national borders (Meagher, 1997 and Nin-Pratt, 2011). As a result, ECOWAS could further strengthen regional trade by formalizing the pre-colonial trade by addressing some of the challenges faced by cross-border traders using these routes (Blein et al, 2008 and Diop, 2012).

Furthermore, several papers demonstrated that ECOWAS has RCA in the production of agricultural goods and is likely to continue to do so (Hanink and Owusu, 1998; Iyoha, 2005; Acharya, 2008; Groetti and Weisfeld, 2008 and Ojide, 2010). Our estimates of ECOWAS RCA and TCI are consistent with these findings. That is, production could be allocated on the basis of RCA while also exploiting production complementarities. Henley et al (2012) and Donge Van et al (2012) noted that Africa could learn from the performance of Asia by developing its agro-industry. This is particularly plausible since evidence has shown that Africa, including ECOWAS members has RCA in agriculture. In addition, our discussion also demonstrated that ECOWAS could exploit its rising population, economic size, and arable land in order to increase trade by increasing production and productivity, especially in the agriculture sector. It was shown that the ECOWAS trade deficit in food and live animals was US$2. 5billion in 2013 despite evidence showing that food imports are relatively more expensive than domestic goods. Furthermore, we also demonstrated that ECOWAS does have RCA in food and live animal production which is not fully exploited. The excessive dependence on rain fed crops alone is not sufficient to spur high production and productivity. Hence, ECOWAS could seek to increase land under irrigation.

However, intra-ECOWAS trade is faced with several challenges which would need to be improved in tandem with exploiting its RCA and TCI potential. These challenges are mainly around the presence of high tariff and non- tariff barriers to trade. For example, a UNECA Report (2012) highlighted that intra-African exporters pay an average tariff rate of 8.7% compared with 2.5% for those that export goods outside Africa. Furthermore, it was noted that the production structure in the region is skewed toward international trade (Hertzenberg, 2011 and Dijk, 2011).

The non-tariff barriers pose extra challenges to intra-ECOWAS trade although it has not been fully researched and understood. The presence of weak production complementarities, low production base; poor transport and communication networks and the relative preference for foreign goods within ECOWAS are a few examples of non-tariff barriers (Aryeetey, 2001; Sako, 2006 and Eggoh and Acclassato, 2013 and Acclassato, 2013).

However, the non-tariff barriers which pose the greatest challenge to intra-ECOWAS trade are the presence of institutional failures in the form of bribe payments at border points and checkpoints. Brenton (2012) and Cissokho et al (2012) estimated these bribes payments between US$100 and US$129 per trip in ECOWAS cross-border trade. This adds to trade costs and serves as a disincentive to intra-ECOWAS trade relative to ECOWAS trade with the rest of the world. Therefore, it could be argued that the low share of intra-ECOWAS trade is a consequence of several factors including high tariff and non-tariff barriers which could be improved through deep integration. Tariff barriers are less difficult to remove relative to non-tariff barriers to trade. Nonetheless, the recurrent bribe payments at border points and other checkpoints despite the customs union status of ECOWAS demonstrate institutional and implementation failures.

Indeed, the ECOWAS president in an interview with the multimedia ECOWAS communication network on the 28th of May 2015 to mark ECOWAS 40-year anniversary noted that bribe payments at border points and checkpoints is a problem in ECOWAS despite all the protocols being signed to allow free movements of goods and people (Multimedia ECOWAS communication, 2015). Therefore, my aim in the subsequent chapters is to assess the conjunction of factors which could determine regional institutional quality in order to inform policy.

CHAPTER FIVE
Determinants of the quality of institutions and the process of convergence in the ECOWAS region

5.0 Introduction and background

Research has shown that the number of regional trading agreements (RTAs) have increased across the world, especially among developing countries to promote regional trade and investment and in the long term attain economic and political union status (McLenaghan et al, 1982; Laird, 2002; Borrmann and Busse, 2007; WTO Report, 2014; African Research Bulletin, 2015). This has raised the issue of whether south-south integration schemes are more desirable than north-south (Venables, 2003; Shiff and Winters, 2003 and WTO Report, 2011). However, the increase in the number of RTAs or the strengthening of old ones could in part, be attributed to the failure of the multilateral trading system to attract the expected gains from trade especially among developing countries in Sub-Saharan Africa (SSA).

Thus, the Economic Community of West African States (ECOWAS) revised its 1975 treaty in 1993 to accelerate their deep integration goal and to increase regional trade (Ernest, 1976; Yansane, 1977; Aryeetey, 2001; Dada, 2013 and UNECA Report, 2013). The preamble in the revised 1993 treaty stated the strengthening of existing institutions and the creation of new institutions that would accelerate the integration process. Nonetheless, intra-ECOWAS trade as a share of their total trade stalled at 10% on average in the last two and a half decades despite the potential to increase their regional trade share (UNCTADSTAT, 2016). Moreover, this has raised issues as to the underlying factors that prevented ECOWAS from exploiting its trade potential despite all the protocols on free movement of goods and people being signed (ECOWAS Parliament, 2014 and Multimedia

ECOWAS Communication, 2015). Some of the factors were discussed in the previous chapters. We highlighted in chapter three and four that progress has been made in launching the common external tariff (CET) in January 2015 and that there have been security interventions in some countries that have been able to maintain relative peace in the region. Hence, official tariff barriers to trade have been eliminated and made ECOWAS a customs union while security is less of an issue now.

Nonetheless, the non-tariff barriers have been difficult to eliminate and could be a source of the low level of intra-ECOWAS trade, including poor transport and communication networks, weak financial system, non-convertibility of ECOWAS currencies and weakness in other trade facilitation institutions (Ajayi, 2005 and Sy, 2014). We argue that the quality of institutions is among the non-tariff barriers that pose the greatest challenge to intra-ECOWAS trade because they are not easily visible and amenable. Indeed, we demonstrated in the previous chapters that ECOWAS cross-border trade costs, additional US$100 to US$129 per trip in bribe payment at border points and unofficial checkpoints that point to weak institutions (inability to monitor and implement the ECOWAS protocols) (Cissokho et al, 2012 and Keyser, 2012). Furthermore, about 50% of intra-African trade financial settlements are conducted with banks outside the continent which point to weak financial institutions in the region (Sy, 2014). Hence, the other 50% of intra-African trade financial settlements are likely to be cash transactions. This makes it even more important to improve the quality of institutions in order to remove the additional costs associated with ECOWAS cross-border trade given that quality institutions have been found to promote trade.

Improving the quality of institutions requires identifying the underlying factors that determine institutional quality in tandem with efforts for convergence. Moreover, convergence could minimize information search costs and facilitate the effective implementation of the ECOWAS protocols on free movement of goods and people. However, empirical research into the determinants of institutional quality is limited due to several factors that have resulted in the use of diverse methodological approaches.

Some papers argue that institutions are complex and are difficult to define and measure (Hodgson, 1998; Chang, 2010; Alexander, 2010 and Albouy, 2012). Furthermore, these papers argue that rules cannot be quantified because their application could be contextual. Hodgson (1998) argued that the introduction of mathematical economics made institutional economics redundant because its complexities cannot be captured in a single mathematical equation. Therefore, research related to the determinants of institutional quality is best explained by describing the nature of the relationship. Some of these papers highlighted that models face endogeneity issues[20] (Straub, 2000 and Alonso and MartinGarcia, 2013). As a result, it is argued that estimates tend to measure policy effectiveness rather than institutional quality (Chang, 2010).

Nonetheless, that has not prevented the use of econometric approaches to measure the conjunction of factors that determine the quality of institutions (Straub, 2000; Islam and Montenegro, 2001; Borner et al, 2004; Kaufmann et al, 2010; Alonso et al, 2013; Javed, 2013 Berggren and Bjørnskov, 2013). These papers assume that the institutional quality indices are perception of agents during their interaction with a particular set of institutions. Hence, they should be treated as proxies that give an indication of the extent to which stakeholders feel about the quality of institutions. Therefore, measurement shouldn't be an issue. Moreover, the use of statistical approaches has a more direct magnitude to inform policy if the estimates are subjected to robust checks.

Koremenos et al (2001) argued that the descriptive approach to research should be treated as a first step to a more sophisticated statistical approach. Acemoglu et al (2001) complemented this view that research related institutions should take one step at a time to develop theory, models and estimation. The theoretical development of the determinants of institutional quality has been established within institutional economics (Javed, 2013 and Alonso et al, 2013). Nonetheless, the link between institutional theory, model and estimation has not been established yet, mainly due to the issue

[20] Endogeneity could arise due to specification issues, multicollinearity, reverse causality and omitted variable bias.

of endogeneity. Furthermore, research in this area is also limited in the context of RTAs and non-existence in the ECOWAS region.

This chapter aims to contribute to the existing discussion about the conjunction of factors that determine institutional quality and the process of convergence with exclusive focus on ECOWAS dataset. The specific focus on ECOWAS dataset offers a new case study that has not been explored in previous research. Furthermore, the focus on ECOWAS could inform ECOWAS policymakers on how to improve the quality of institutions and the process of convergence, given that they are a recurrent failure in the region (Boettke and Fink, 2011; Helble et al, 2012; Lejarraga and Shepherd, 2013; Salvatici, 2013 and Assane et al, 2014).

The structure of the chapter is as follows. We will first discuss conceptual theories of institutions in section 5.1 as the basis to inform our methodology. Section 5.2 will discuss existing literature about the determinants of institutional quality and convergence. Section 5.3 will discuss the methodology, including the basis for our modelling and estimation method. This was discussed in part, in chapter two. Section 5.4 discusses the variables that are going to be used to estimate the model while section 5.5 analyses the results. Section 5.6 concludes the chapter. The basis of this chapter hinges on the proposition that weakness in the quality of institutions levies high costs to ECOWAS cross-border trade that could be understood better if the conjunction of factors that determine institutional quality are estimated while also examining the process of convergence.

5.1 Conceptual theories of institutions

We mentioned in section 5.0 that the theoretical development of the determinants of institutional quality has been established within institutional theories. The aim of this section is to explain the institutional theories in order to underpin our research question in the context of RTAs. Institutional theories have two dimensions. The first dimension predicts that institutions are vital in economic transactions because they create certainty, coordinate market activities and lower transaction costs (Kasper and Streit, 1998; Rodrik, 2007; Furubotn and Richter, 2010; Turkson, 2012 and Alonso and Garcimartin, 2013). Hence, weakness in the quality of institutions or differences in institutional qualities leads to a contraction of economic transactions including trade flows. Therefore, there is a positive relationship between good institutions and trade expansion.

A gravity model or a computable general equilibrium model is used to estimate trade flows as a function of institutional quality and other variables (De Groot, 2003 and Turkson, 2012). Their findings support the view that institutions matter in all forms of transactions, including trade flows (De Groot, 2003 and Lejarraga and Shepherd, 2013). Similar studies within ECOWAS also found a positive relationship between institutional quality and intra-ECOWAS trade (Shams, 2003; Ajayi, 2005; Zannou, 2010; Cissokho et al, 2012; Brenton et al, 2012 and Assane et al, 2014). Related studies in this area also investigate how trade leads to convergence of income and prices, which can also be applied in the context of institutions. Their findings support the convergence of income and prices for trading partners (Helpman and Krugman, 1985; Ben-David, 1996 and Zhang, 2006). Nonetheless, this first dimension ignores an important aspect of the discussions about institutions that could be vital to inform policy.

The second-dimension attempts to consider this limitation by theorising the origins of institutions or the determinants of their quality. We are mainly interested in the latter dimension about the determinants of institutional quality from a theoretical perspective. Distinctions are usually made between political and economic institutions (North, 1990; Maki et al, 1993; Treisman, 2000; Borner et al, 2004 and Aoki, 2007). Political institutions are derived from societal norms and belief system while economic institutions are determined by the repeated interaction of rational agents (Powelson, 1972; North, 1990; Hodgson, 2006 and Furubotn and Richter, 2008). Therefore, attempts to improve the quality of political institutions require altering the norms and beliefs of a society while improving economic institutions requires cooperation by rational agents to do so. Given that norms and beliefs could suffer from change resistance (Maseland, 2008 and

Shirley, 2008), there must be a need to alter them with a view of improving the quality of institutions. This implies that institutions could not be imposed; rather, they evolve over time based on the need to continue to do so. Moreover, political institutions are assumed to shape economic institutions because they contain formal rules and enforcement properties that can provide certainty and coordinate economic activities (North, 1990). Therefore, the quality of economic institutions is conditional on the quality of political institutions and the repeated interaction of agents. Hence, economic institutions are more easily amenable to meet new forms of interactions than political institutions. Indeed, references will be made in section 5.3.2 that demand for better trade institutions by traders led to their improvement in ancient Europe (Milgrom et al, 1990; Grief et al, 1992 and Pugh and Trefler, 2012).

There are four institutional theories associated with the determinants of institutional quality, namely; the neoclassical view, new institutional economics (NIE), institutional political economy (IPE) and path dependent theory. Neoclassical economic theories are popular in the economics discourse. The neoclassical view on institutions is similar to the conventional neoclassical postulate that the pursuit of individual self-interest through competition leads to optimal outcomes that allocate resources efficiently (North, 1990; Hodgson, 1998 and Fafchamps, 2004).The neoclassical view postulates that if agents agree to rules during exchanges, these rules would be optimal outcomes called institutions and would be subjected to changes only if exogenous shocks occur (Boland, 1979 and La Porta, 1999). For example, changes in relative prices could signal to rational agents that new forms of institutional arrangements are needed to satisfy future transactions (North, 1990 and Javed, 2013). Therefore, a proposition of the neoclassical theory of institutions, assumes that the quality of institutions is determined by the repeated interaction of agents that lead to the emergence of institutions and could be subjected to changes if agents alter their interactions due to demand for new forms of institutional arrangements. Moreover, the key aspect of the neoclassical view that is useful for modelling purposes is that exchanges of goods and services by agents determine the type and quality of institutions. Hence, neoclassical theory implies that institutions are optimal outcomes once they are created and that the problem lies with the absence of institutions (La Porta, 1999). Therefore, estimates should focus on the origins of institutions rather than determinants of institutional quality since they are treated as optimal outcomes once they exist.

The view that interaction of rational agents leads to optimal outcomes has been criticised. Simon (1987) argued that the optimal outcome proposition implies that institutional constraints does not exist. As such, nothing could be done to improve institutional quality if we assume that interactions generate rational outcomes (La Porta et al, 1999). Musole (2009) has further criticised the neoclassical view of institutions. He argued that if institutions represent rational outcomes through repeated interactions of agents, then economies that are performing badly would either develop or emulate economies with better institutions; in which case emulation, would effectively lead to the convergence of institutions across the globe. However, global evidence shows differences in the quality of institutions in space and time and across nations and regions (Straub, 2000 and Musole, 2009). Our discussion in chapter three also found differences in the quality of institutions over time in the ECOWAS region. Hence, interaction of agents alone does not necessarily lead to optimal institutional quality. This is justified because not all agents possess perfect information during interactions in order to make rational decisions that maximises their utility. Nonetheless, the proposition that repeated interaction of agents determine institutions is useful from a modelling point of view since it clarifies the direction of causality at least in the initial stages.

The NIE does not deviate from the neoclassical view of institutions. It also postulates that repeated interaction of agents lead to the emergence of norms that could ultimately determine the quality of institutions. Nonetheless, the NIE assume that the interaction of agents is conducted from a cooperative and mutual behavior rather than from an individual competitive behavior of the neoclassical view (Aoki, 2007; Furubotn and Richter, 2008; Furubotn and Richter, 2010; Gamberoni, 2010 and Alonso et al, 2013). This view assumes that competitive behaviour could not result to common rules that would be acceptable to all agents. Furthermore, the NIE assume that the rules or institutional framework derives from agent's interactions may not necessarily be optimal, although they could be the best rules of the game given the constraints imposed on agent's due to lack of perfect information (North, 1990; Knaack et al, 2007; Musole, 2009 and Castellano et al, 2012). In the context of RTAs, NIE proposition suggests that trade could determine institutional quality if regional production is sufficient to increase regional demand and subsequently better institutions. Therefore, the neoclassical view and the NIE are identical in terms of their assumptions that repeated interactions of agents in socioeconomic affairs determine the quality of institutions. Nonetheless, the NIE assume that the interaction is conducted through cooperative behaviour while the neoclassical view assumes a competitive behaviour. In the context of RTAs, interaction of countries would be associated with cooperative behaviour. These interactions manifets themselves through trade, investment and other economic and political activities. Therefore, the NIE and the neoclassical view implicitly assume that the quality of institutions is determined unidirectionally through the interaction of agents. This makes modelling and estimation relatively predictable because it recognises the difficulty to eliminate endogeneity entirely. Diebold (2007) argued that estimations should be interpreted as the independent variables containing useful information in explaining the dependent variable rather than the establishment of the direction of causality.

The unidirectional assumption of NIE has been criticised for not addressing the endogeneity issue (Castellano et al, 2012 and Alonso et al, 2013). Zhang (2006) has also criticised trade theories for not addressing endogeneity issues when estimating the convergence of income and price for trade partners. Similarly, the NIE has ignored the vital role of the state especially in the negotiation and enforcement of protocols that could be treated as common institutions within RTAs (Raiser et al, 2001). Institutional political economy (IPE) extends this debate by integrating the role of the state in determining the quality of institutions.

The IPE also assume that interaction of agents determines the quality of institutions. Nonetheless, IPE emphasizes the role of the state in deciding the type and quality of institutions since they control power that enforces and implement the institutional arrangements. Therefore, IPE mainly address how political institutions are determined and the extent to which they structure economic transactions. The IPE postulates that agents lobby governments to improve institutions and how much the government integrates each agent's interest determine the quality of institutions. Therefore, the power structure between lobbyist and the government could determine the design and quality of institutions that has the potential to discriminate or tolerate the needs of every stakeholder. Furthermore, the IPE also assume that while interactions shape and determine the quality of institutions, institutions also shape and determine interactions because they coordinate interactions (Aoki, 2007; Zweynert, 2009 and Castellano et al, 2012). Therefore, there is bidirectional causality. From a modelling point of view, bidirectional causality can be difficult to estimate since many regression equations assume one-way causality (Banerjee et al, 2003; Baltagi, 2005 and Wooldridge, 2013). Therefore, modelling determinants of institutional quality within the IPE requires establishing what comes first in the famous chicken and egg debate. This will be discussed further.

Another dimension about the determinants of institutional quality is the path dependent theory. The theory postulates that the quality of current institutions is explained by their past behaviour and the past behaviour of other variables (Acemoglu et al, 2001; Easterly and Levine, 2003 and Nunn, 2008). Hence, if institutions were weak in the past, it is likely that they will continue to do so except if exogenous shocks occur to change the direction of causality. Like the neoclassical view, changes in these shocks could lead to demand for better institutions in the future. In the context of RTAs, the demand for common and quality institutions is conditional on increased interaction of countries that motivate such demand.

The path dependent theory of institutions also assume that institutions are determined by societal norms and beliefs system. As a result, they are viewed as static processes which do not change over time. Countries would have to adjust their norms in order to improve the quality of their institutions. The path dependence theory has many implications. First, if societal norms determine institutional quality, would it be possible to emulate norms elsewhere in order to improve institutional quality? The answer to this is that institutions cannot be imposed directly; they should evolve through changes in societal ways of doing things. Second, societies that are resistant to change are likely to exhibit weak institutions today if their institutions were weak in the past. Third, based on our assessment in chapter three, the quality of institutions in West Africa should be less fragmented today given the extent of their standardisation in the past while the exogenous shock that took place during colonialism could be associated with the drawbacks in the development and standardization of the quality of institutions in the region (Acemoglu et al, 2001 and Nunn, 2008).

The path dependent theory fits well in studies related to the determinants of institutional quality since we expect past institutions to contain memory in explaining current institutions.

In Summary, a common feature of these theories is that interaction of economic agents determines the extent to which agents demand better institutions that coordinates future transactions, provides certainty and minimizes costs of future transactions. Hence, lesser interactions lead to less demand for better institutions. This could be modelled where the quality of current institutions is determined by the interaction of countries and the past behaviour of institutions. The use of panel data ensures that these interactions are captured in a single model. The folk theorem established that if agents or countries interact over an extended period (repeated) of time, it will generate norms that leads to cooperation (Koremenos et al, 2001, p. 787). This is particularly useful from a modelling point of view because it gives an indication of the direction of causality. Nonetheless, institutional theory is not clear about the selection of relevant variables for modelling purposes. It is left to the researcher to decide which set of variables are relevant in determining the type of institutions of interest (Chang, 2010). Nonetheless, several papers, use openness and the level of development as important determinants of institutional quality (Straub, 2000; Rosendorff and Milner, 2001; Shepherd and Lejarraga, 2013; Alonso et al, 2013 and Kuncic, 2014).

Since the aim of this thesis is to investigate the determinants of the quality of institutions in the ECOWAS, it could be expected that the export structure and the level of development could be relevant in generating demand for good institutions in the region.

5.2 Contextual literature review

5.2.0 Introduction

As we discussed in chapter one, the main aim of this thesis is to examine the conjunction of factors that determine the quality of institutions and the process of convergence of institutions in the ECOWAS region. Therefore, it is plausible to review the existing literature related2 to determine what has been done and to inform the methodological approaches in this chapter.

Literature about the determinants of institutional quality takes a descriptive or empirical approach to research. We argued in chapter two that the descriptive approach should be treated as a first step toward a sophisticated statistical approach. We highlighted that the empirical approach is limited due to the endogeneity issue which has made modelling and estimation difficult. This will be explored in more detail in section 5.2.2. The convergence literature has received some attention in the trade theories where the convergence of price and income for trade partners have been tested with mixed results. This was discussed in chapter four. However, literature about the extent to which the quality of institutions could converge for trade partners is limited. We argue that the convergence concept could be applied to institutions in the context of RTAs because the success of RTAs could depend on it.

As discussed in chapter two, the literature is quite scattered in terms of scope, hence we will review relevant literature and then contextualise it to the ECOWAS region. Section 5.2.1 will discuss the literature on convergence and the determinants of institutional quality in section 5.2.2.

The convergence models and literature find their roots within the growth and trade theories argument that trade leads to factor price equalisation as discussed in chapter four (Ruffin, 1988 and Zhang, 2006); hence, different versions of autoregressive models have been used either with panel or time series data to test whether trading partners exhibit convergence of price and income (Ranjan, 2003 and Zhang, 2006). We want to modify and extend this argument to determine the extent to which institutional quality convergence occurs for trading partners using the ECOWAS dataset as a new case study. The literature about the determinants of institutional quality find their root within the institutional economic theory argument that socioeconomic, political and cultural factors determine institutional quality (Islam and Montenegro, 2002 and Alonso et al, 2013); hence, different versions of methods of least square are used mainly with panel data to estimate such relationships.

Therefore, this chapter could focus on whether being a member of ECOWAS leads to convergence of institutions or identify the conjunction of factors that determine the quality of institutions in the region or a combination of the two. Our aim is to look at both since they are complementary.

5.2.1 Literature on Convergence

The convergence literature finds its root in trade and growth theories. It is assumed that liberalised economies will, over time, exhibit income and price convergence of the traded commodities due to labour and other factor movements which will lead to spillover effects and price parity (Samuelson, 1948; Ben-David, 1996; Mountfort, 1998; Ranjan, 2003 and Zhang, 2006). Linder (1961) highlighted that the closer countries are in their demand preferences, the greater their volume of bilateral trade. This implies that the convergence of demand preferences for trading partners or those within an RTA is going to increase intra-industry and intra-regional trade. This is due to the trade theories assumption that countries are likely to produce goods that are demanded domestically while surplus arising from efficiency of production is exported. Ruffin (1988) further argued that factor price equalisation can eventually lead to income equalisation; implying that international trade causes convergence of prices and incomes. Empirical findings relating to many trading partners have been mixed. However, the assumptions of the convergence nexus are not dissimilar to the NIE and the folk theorem assumption that repeated interactions of countries or agents could lead to the emergence of norms that could transform into common institutions. Therefore, although models of the convergence nexus are explained within the context of price and income, the principle can be extended to capture convergence of institutions within an RTA.

Indeed, Helble et al (2009) and Helble et al (2012) looked at how institutional quality differences impacts trade flows between nations. Helble et al (2012) found that $11.7million of aid directed to trade policy and regulatory quality reforms (institutions) leads to $818million increase in global trade using a gravity model. Similarly, institutional quality differences within RTAs on average lead to an estimated 30% less trade between pairs of countries than those with similar institutions. These findings suggest that common institutions are desirable as they promote trade. However, they did not look at what determines institutional quality differences or what leads to the convergence of institutions within an RTA. In ECOWAS, it has been found that bribes and delays at border points (weak regulatory quality) add to trade costs, uncertainty and coordination failures (Golub et al, 2009; Brenton et al, 2012 and Cissokho et al, 2012). These trade costs could be minimised if ECOWAS improved the implementation of their protocols since they represent the convergence of rules.

Lejarraga and Shepherd (2013) also argued that RTAs with deeper mechanisms for enhancing transparency commitments are more trade promoting than those with shallow commitments. Each transparency commitment negotiated leads to an estimated 1% increase in bilateral trade flows and the willingness to adhere to transparent norms is influenced by the export structure of nations and by domestic institutional quality.

Lejarraga and Shepherd's (2013) findings are synonymous to saying that common institutions within an RTA are desirable because they lead to more regional trade since they reduce uncertainty as well as lower transaction costs. Their findings are quite revealing and useful in the sense that RTAs should aspire for deeper integration through convergence as espoused by Lee and Park (2007). In their paper, Lejarraga and Shepherd (2013) further argued that relative differences in per capita incomes, culture and language and the degree of domestic democracy and governance influence institutional quality convergence within RTAs. They used a Probit and gravity model to estimate the extent to which transparency commitments of countries i and j is a function of the factors discussed in the previous sentence. However, Lejarraga and Shepherd (2013) did not test for endogeneity (reverse causality) and autocorrelation.

The convergence literature is quite diverse in the modelling field although the Granger causality and cointegration test have been used (Zhang, 2006). Ben-David (1996) investigated whether countries whose imports are more than 4% from a trading partner exhibited income convergence over time. He used a simple autoregressive model (Augmented-Dickey-Fuller model) where he found that it is openness that leads to convergence rather than the volume of trade. The model is specified thus;

$$(\mathrm{Y}_{\mathrm{i,t}} - \overline{\mathrm{Y}}_{\mathrm{i,t}}) = \emptyset\,(\mathrm{Y}_{\mathrm{i,t-1}} - \overline{\mathrm{Y}}_{\mathrm{i,t-1}}) + \varepsilon_{\mathrm{i,t}} \qquad (5.\ 1)$$

Where;

$\mathrm{t} = \text{time in years}$

$\mathrm{Y}_{\mathrm{i,t}}$ is log of per capita income of country i at time t,

$\overline{\mathrm{Y}}_{\mathrm{i,t}}$ is average income of the sample and

$\mathrm{Y}_{\mathrm{i,t-1}}$ and $\overline{\mathrm{Y}}_{\mathrm{i,t-1}}$ are the lags of the series

The proposition is that a value of $\emptyset < 1$, implies convergence among trading partners while a value greater than 1 implies divergence. Ben-David's (1996) findings support the view that income convergence takes place among groups of countries that open their markets to international trade.

We can apply an institutional quality data set to equation 5.1 in order to estimate if the quality of institutions converge over time assuming no autocorrelation. In addition, equation 5.1 is also useful in capturing a path dependence relationship that is relevant in the context of ECOWAS.

Zhang (2006) has furthered the trade and convergence relationship debate by investigating how trade within the EU, ASEAN, NAFTA, and WORLD leads to income convergence using a Vector Error Correction Model (VECM). The aim of the paper was to look at the extent to which trade reduces income inequality among trade partners. The Gini index (income inequality) was used as the dependent variable and intra-region trade as a percentage of GDP was used as the independent variable from 1960 to 2003. As we highlighted earlier, the expectation of such estimation is that factor movements, particularly of labour, would push wages upwards or downwards between trading partners which will over time lead to equalisation. In the absence of that, consumers would tend to purchase imports if they are relatively cheaper than domestic goods. Domestic producers would then be forced to amend their prices to match import prices. These arguments were discussed in chapter four from trade theories point of view. These arguments assume that consumers and workers have time to search prices in many locations which is not always likely. Nonetheless, using VECM hinges on nonstationary data in which case Granger-causality cannot be used to test the direction of causality. Symbolically, Zhang (2006) equation is specified in 5.2;

$$\Delta \mathrm{gini}_t = C_1 + \alpha_c \mathrm{ect}_{t-1} + \sum_{i=1}^{n-1} \beta_{1i}\, \Delta \mathrm{gini}_{t-1} + \sum_{i=1}^{n-1} \gamma_{1i}\, \Delta \mathrm{trade}_{t-1} + \varepsilon_{1t} \quad (5.2)$$

Where;

$\Delta \mathrm{gini}_t =$ change in income inequality or first difference,

$C_1 =$ constant,

$t =$ time in years

$\mathrm{ect}_t =$ is a vector of residuals from OLS. long − run equilibrium relationships

$\alpha_c =$ reflect the speed of adjustment of gini to long − run equilibrium and

β_{1i} and γ_{1i} measures how changes in past gini and trade affect current gini

The findings from Eq 5.2 support the view that free trade between EU members leads to income convergence in the long run and that the direction of causality is bilateral which is consistent with the IPE. Like equation 5.1, equation 5.2 can also be used to estimate how institutions would converge over time based on their past behaviour and past behaviour of trade.

In the context of ECOWAS, Jones (2002) found that ECOWAS countries per capita income has been converging at a rate of 1.7%. This means that every year, the gap between per capita incomes in ECOWAS narrows by about 1.7%. However, it is not clear whether it is the income of the poorest countries that is rising faster than the rich countries or are the rich countries' economies growing slower than the others in the region.

In summary, the review of the convergence literature suggest that it could be extended to estimate the extent to which the quality of institutions within an RTA exhibit convergence especially for RTAs aspiring for deep integration. This is plausible because deep integration could not be attained and sustain without common institutions. Therefore, we intend to apply the Ben-David (1996) model to estimate the process of convergence of institutional quality using the ECOWAS dataset as a new case study.

5.2.2 Literature on the determinants of institutional quality

The existing literature about the determinants of institutional quality finds its roots in the standard economic theories which NIE and IPE have attempted to accommodate within institutional economics. The basic premise of these theories is that institutions originates from societal norms while repeated interactions of agents could lead to new forms of institutional arrangements. Therefore, the outcome of repeated interactions could be treated as the best possible rules although not necessarily optimal. This is a fundamental departure from the neoclassical theory of rational optimality.

Few papers attempted to examine determinants of institutional quality in the context of an RTA and non-existence in the context of ECOWAS. Borner et al (2004) highlighted that research into the determinants of institutional quality is just beginning with no well-established theory and model. Shirley

(2008) and Maseland (2008) further argued the lack of a clear theory and model within institutional economics is due to the diversity in societal belief systems and difficulty to predict determinants of institutional quality in societies hostile to change. As a result, the research approaches take two dimensions.

The first approach describes origins of institutions by justifying a case where, socioeconomic, historical, political and cultural factors are assumed to influence institutional quality without any model specification and estimation (North, 1990; Koremenos et al, 2001; Subramanian, 2001; Bloch and Tang, 2004; Rodrik, 2007; Moyo, 2009; Moss et al, 2009; Boettke and Fink, 2011; Maseland, 2011; Chang, 2011 and Castellano et al, 2012). Others used comparative political economic studies to assess how institutional quality manifests itself based on country differences and agent's interest (Musole, 2009; Aoki, 2009 and Rothstein, Persson and Sjostedt, 2010). Their argument is that the composite values of institutional quality are subjective, as discussed in chapter two. In addition, they argued that it is impossible to capture and identify all the conjunction of factors which determine institutional quality in a single equation. Therefore, describing the nature of relationship is appropriate.

The second approach attempts to specify models where, institutional quality is assumed to be a function of socioeconomic, historical, political and cultural factors. However, such models lack clear theoretical underpinnings and direct links with estimation methods due to endogeneity issues. The least square method or probability models are used where instrumental variables or lag are proxies to correct endogeneity (Straub, 2000; Treisman, 2000; Rijckeghem and Weder, 2001; Islam et al, 2002; Brunetti and Weder, 2003; Borner et al, 2004; Herger et al, 2008; Mocan, 2008; Siba, 2008; Kandil, 2009; Javed, 2013 Berggren and Bjørnskov, 2013; and Alonso and GarciaMartin, 2013). Although the endogeneity issue has made it difficult to model determinants of institutional quality with a clear theoretical underpinning and estimation method, existing papers in the second approach have use econometrics to estimate determinants of institutional quality using least square methods.

Raiser et al (2001) looked at factors that determine institutional quality using time series and cross section data from 1995 to 1999 for 25 nations in Eastern Europe and the Balkans. They used a combination of structural equation models and autoregressive models with the recognition that no single model can adequately capture factors assumed to influence institutional quality. They used latent variables as proxies to resolve endogeneity and subsequently Generalised Least Square (GLS) to estimate the degree of relationship. They tested whether liberalisation, privatisation, shift in trading partners, path dependence, finance and state capacity impact on institutional quality. They found that 10% increase in public expenditure to GDP ratio (proxy for state capacity) leads to 0.02% improvement in institutional quality. Similarly, 20% increase in exports leads to 0.03% improvement in institutional quality. Raiser et al's (2001) findings are useful in the selection of relevant variables for ECOWAS and the theoretical exposition in section 5.1 because they demonstrated that export pattern and state capacity can determine institutional quality.

Structural equation models (SEM) are sometimes referred to as simultaneous equation models, causal analysis modelling, path analysis or covariance structure analysis (Ullman and Bentler, 2012). Ullman and Bentler (2012) argued that SEM models allow multidimensional complex relationships and the presence of endogeneity to be analysed. Herger et al (2008) and Rodrik et al (2004) have used structural equations in their papers. Herger et al (2004) argued that while institutional quality (INS) is determined by financial development (FIN), trade (TRD), culture (CUL), geography (GEO) and history (HIS), institutional quality also determines these factors within the IPE framework. This is expressed as;

$$\alpha_{11}\mathrm{FIN} + \alpha_{12}\mathrm{INS} + \alpha_{13}\mathrm{TRD} + \beta_{11}\mathrm{CUL} = c_1 + \epsilon_1 \qquad (5.3)$$

$$\alpha_{22}\mathrm{INS} + \alpha_{23}\mathrm{TRD} + \beta_{21}\mathrm{CUL} + \beta_{22}\mathrm{GEO} + \beta_{23}\mathrm{HIS} = c_2 + \epsilon_2 \qquad (5.4)$$

$$\alpha_{31}\mathrm{FIN} + \alpha_{32}\mathrm{INS} + \alpha_{33}\mathrm{TRD} + \beta_{32}\mathrm{GEO} = c_3 + \epsilon_3 \qquad (5.5)$$

Where [CUL, GEO and HIS] are assumed exogenous variables while [FIN, INS, TRD] are assumed endogenous. c_1, c_2 and c_3 are intercepts while

ϵ_1, ϵ_2 and ϵ_3 are the disturbance terms. Hox and Bechger (1998) argued that SEM can estimate parameters while simultaneously assessing the fit of the model. As a result, it is ideal for research where data are likely to suffer from endogeneity. Therefore, one needs to run all 3 equations simultaneously (5.3; 5.4 and 5.5) with a function;

$$\gamma'\mathrm{A} + \mathrm{z}'\mathrm{B} = \mathrm{c}' + \epsilon' \tag{5.6}$$

Where

γ' is 1x 3 vector of the endogenous variables [FIN, INS, TRD] and z' is 1x3 vector of exogenous variables [GEO, HIS, CUL]. However, one problem with SEM, according to Herger et al (2008), is that some of the parameters from a regression cannot be retrieved. As such OLS and 2SLS are used where instrumental variables are identified as proxies to correct for endogeneity. Thus, the link between eq 5.3 to 5.6 has not been made clear regarding the use of appropriate estimation method. Indeed, this is one of the fundamental arguments by Chang (2010) that it is difficult or impossible to model determinants of institutional quality since it is difficult to capture the complexity of factors in a single model as well as to determine the appropriate direction of causality. Similarly, the SEM lacks a coherent estimation method since it relies on OLS or 2SLS (Wooldridge, 2013). Therefore, we cannot use the SEM in the empirical research that I intend to do since some of the parameters might be lost. Furthermore, SEM is indifferent from least square method of estimation given that the process ends up using the least square methods (Gujarati and Porter, 2009 and Wooldridge, 2013).

As such, Herger et al (2008) used 2SLS and found that the level of development, language, colonial history, common law, religion, ethnic diversity, and latitude all impact on the quality of contract institutions using cross-country data. However, the fundamental criticism of using instruments is whether the instruments are a good proxy for the variable and whether they have strong estimation power (Chang, 2010; Shepherd, 2010 and Albouy, 2012). Therefore, other options could be explored in order to emerge with strong estimation power.

To further draw on the variables used in the existing literature, the rational choice and incentive structure models assume that the quality of institutions is based on utility maximisation subject to constraints imposed on individuals or countries (Rijckeghem and Weder, 2001; Mocan, 2008 and Furubotn and Richter, 2010). That is, each country has a target institutional quality that it wants to attain subject to its domestic constraints and the constraints from its partners. Hence, economic benefits serve as an important stimulus in improving the quality of institutions (Hadfield, 2008 and Alonso et al, 2013). The benefits can be measured by the repeated of interaction of countries in the areas of economic, cultural and political factors. However, most research about the determinants of institutional quality describes the nature of the relationship rather than specifying a model (Koremenos, et al, 2001; Aoki, 2007 and Musole, 2009). Some papers have specified models without estimation (Rosendorff and Milner, 2001 and Levechenko, 2012).

Papers that have estimated determinants of institutional quality resort to the use of instrumental variables method without any strong link between theory, model and estimation (Straub, 2000; Islam and Montenegro, 2002, Borner, 2004 and Alonso et al, 2013). For example, Easterly and Levine (2003), Siba (2008), Mocan (2008) and Kandil (2009) used OLS to estimate institutional quality. They argued that endogeneity cannot be removed entirely in research related to the determinants of institutional quality. As such, all we do is to find out how useful some variables are in explaining institutional quality. Their findings support the view that socioeconomic, historical and cultural factors influence institutional quality. Diebold (2007) argued that the term causality is used to save space; hence we should be saying that independent variables contain useful information in predicting dependent variables rather than the establishment of causality.

Hodgson (2006) discussed how institutions that facilitate trade depend on domestic socioeconomic and political factors and those of their trading partners. That is, each country has a target institutional quality which is determined by its domestic constraints and the quality of the institutions of its trading partners. Hodgson (2006) argued that since institutions structure social interactions, their functional form and quality must emanate from the perceived benefits of repeated interactions. This argument is consistent with oligopoly theory where individual firms make quantity and pricing decisions by taking account of their competitor's decisions. However, Hodgson (2006) did not specify a mathematical model. Consistent with other findings, Hodgson (2006) argued that repeated societal interactions influence institutions. Therefore, there is unanimity in the research field that repeated societal interactions (economic, political or social) contain useful information in explaining the quality of institutions before they in turn structure human behaviour (Jaccard and Jacoby, 2012). The folk theorem highlighted that these interactions must be repeated several times before they constitute institutions or generate motivations to improve them.

Another line of argument within institutional economics looks at how history influences current institutions. Acemoglu et al (2001, 2005) and Nunn (2007) argued theoretically that past institutions contain memory in explaining current institutional quality. This is useful in the context of ECOWAS since 14 of the 15-member states were colonised by France, Britain, and Portugal. Acemoglu et al (2001; 2005) used European mortality rates in former colonies as a measure of past institutions to test how they influence current institutions.

The justification for using mortality rate as proxy for past institution by Acemoglu et al (2001) was that they might be uncorrelated with the error term. However, it has been shown that first difference can eliminate or reduce correlation (Gujarati, 2006 and Gujarati and Porter, 2009). Alonso et al (2013) has also used lag to measure determinants of institutional quality with the argument that they are less correlated with the current error term. Whichever way, Acemoglu et al (2001) found that variation in the quality of current institutions in former colonies can be explained by the pattern of European settlements (past institutions). These are very important findings for several reasons.

First, it assumed that Europeans institutions have been superior in historical times; hence poor institutions are visible in places where they did not settle, which Chang (2011) has criticised giving China as an example. Secondly, our discussion in chapter three demonstrated that West Africa had standardised trade institutions before the collapse of the Songhai Empire and subsequent colonialism (Rodney, 1981 and Brenton et al, 2012). Nunn (2007) has also argued that Africa had high production and institutional development before the slave trade and colonialism. However, due to the extractive process during the colonial period, Africa was trapped into a low development level which persists today. Nonetheless, the argument demonstrates that modelling determinants of institutional quality is feasible as a function of current or lag variables and past institutional quality.

Rosendorff and Milner (2001) also described determinants of bilateral trade barriers. However, their propositions were mainly abstract, and no data and estimation were advanced. The paper is identical to Hodgson's (2006) paper on how domestic institutions are determined in an open economy. They used a cooperative oligopoly theory to model how bilateral trade barriers are determined between trading partner i and j. The model argued that bilateral trade barriers of partner i depend on domestic consumer surplus (CS) corresponding to the trade barrier t, producer surplus (PS) and government domestic tariff revenue (M), corresponding to the trade barriers. That is, the utility government gets from its domestic trade barrier t and that of the foreign trade barrier t^* depends on home CS, PS and M. We should expect CS to increase as trade barriers fall since this can lower import and domestic product prices. Government tariff revenue can fall, increase or remain constant depending on the elasticity of imports to a change in trade barriers. Domestic PS can fall if imports lower the price of domestic goods or it can increase if the partner also lowers its trade barrier which leads to increased exports for the partner. Therefore, governments will optimise trade barrier as a function of CS, PS and M.

Rosendorff and Milner (2001) argued that in a political economic perspective, governments want to maximise CS, PS, and M because they want re-election, which is funded through donations from businesses, as well as the ability to raise revenue for public goods provision. They argued that each country gives weight to the benefits arising from the bilateral trade barriers. Each country has the incentive to cooperate with the other if the average benefits are greater than or equal to the individual benefits. If the cost of reneging is higher, then the equilibrium IQ through cooperation will hold until some exogenous shocks occur. However, the problem with specifying such a utility function, as we discussed earlier, is that we are assuming that each country can freely choose their level of trade barrier optimally. The NIE argument is that, although this explanation can hold, it does not necessarily generate an optimal outcome. Furthermore, the model was not estimated by Rosendorff and Milner (2001) although it is a step to further understand how trade barriers could be determined as a function of domestic benefits and constraints from partner countries.

Similarly, the notion that consumer and producer surplus and tariff revenue influence the extent to which countries are willing to set trade barriers is useful in the context of ECOWAS given the heavy dependence on trade taxes as a source of revenue (Tanzi and Zee, 2000; Ekpo, 2004 and Walkenhorst, 2006).

Specific literature on what determines institutional quality and convergence in ECOWAS is limited. As far as I am aware, no research exists pertaining to how economic factors determine the quality of institutions in ECOWAS; although, Straub (2000), Alonso et al (2013); Islam and Montenegro (2002) and Siba (2008) have considered determinants of institutional quality using countries from different continents that also included some ECOWAS members. However, Chang (2010) has criticised the use of cross-country data in regressions relating to what determines institutional quality since it cannot inform policy specifics for a particular region or country. Therefore, using exclusive ECOWAS dataset can extract useful policy implications for the region deep integration scheme.

In summary, the literature review demonstrates that we could use trade theories to estimate the process of convergence of institutional quality in ECOWAS. Similarly, it demonstrates that the quality of institutions is a function of domestic socioeconomic factors, past institutional quality and the quality of institutions of its partner. Table 5.1 below summarises the literature we reviewed in this section.

Table 5.1 Summary determinants of institutional quality

				Historical Determinants							Economic Determinants							Political Determinants					
Researchers/ Variables	**Methods**	**Time**	**Coverage**	Religious homogeneity	Ethnic homogeneity	Colonial origin/ legal origin	years of independence	Firm & Industry Size	Geography/ Latitude	Press freedom	Income- GD/ per capita	income inequality	FDI & Financial development	Natural Resources	Relative Wages	Price Distortions	Openness	Government Type	Education level	Aid Dependency	Tax System	Bureaucratic Incentives	Checks & Balance
Engerman and Sokoloff (1994)	Describe	1500-1997	Americas		✓			✓				✓											
La Porta (1999)	OLS	1970-98	World	✓	✓	✓			✓		✓												
Straub (2000)	OLS/WLS	1980-98	World		●					✓	✓			✓	✓	✓	✓					✓	✓
Easterly & Levine (2003	OLS	1960-95	World	✓	✓	✓		✓	✓					✓									
Acemoglu et al (2005)	OLS	1985-95	World			✓	✓				✓								✓				
Islam et al (2002)	2SLS/OLS	1984-97	World		●		●			✓	✓	✓		✓			✓						
Subramanian et al (2003)	Describe	none	World						✓		✓						✓						
Alonso et al (2013)	IV	1989-06	World		●	●			✓		✓	✓		●			●		✓		✓		
Mocan (2008)	OLS	1997-03	World								✓								✓				
Borner et al (2004)	OLS	1986-99	World	✓						✓	✓	✓					✓	✓					
Herger et al (2008)	2SLS	1965-04	World	✓	✓	✓			✓								✓						
Rodrik et al (2004)	2SLS	1950-02	World						✓		✓						✓						
Rijckeghem et al (2001)	OLS	1982-95	World		●					✓	✓				✓				✓			✓	
Brunetti et al (2003)	OLS/2SLS	1994-98	World		✓					✓	✓					✓	✓	✓					
Bloch and Tang (2004)	Describe	1984-02	World								✓		✓				✓						
Chong et al (2000)	OLS/corre	1982-91	World			✓	✓				✓								✓				
Kandil (2009)	OLS/ corre	1970-05	MENA								✓		✓				✓						
Siba (2008)	OLS	1980-03	SSA		●	●			✓	✓										✓			
Rodrik (2007)	Describe	None	World						✓		✓						✓						
Moss et al (2006)	Describe	none	SSA																	√	√		
Keane et al (2010)	Describe	1990-09	SSA														✓						
Levechenko (2012)	OLS	1970-99	World	✓	●	✓					✓						✓		✓				
Moyo (2009)	Describe	none	SSA																	✓			
Triesman (1998)	WLS/ OLS	1980-98	World	✓	✓	✓					✓			✓			✓	✓					✓
Berggren et al (2013)				✓		●					✓						✓						

Source: Authors Compilation. ✓- statistically significant and ●- not significant: **WLS**- Weighted Least Square**; Corre**- Correlation**, OLS**- Ordinary Least Square; **2SLS**- two stage least square; **IV**-instrumental variable; **world**- cross country inter-continental coverage (not necessarily the whole world).

5.3 Methodological approaches

5.3.0 Introduction

We highlighted in section 5.1 that institutional theories predict that repeated interaction of agents determines the quality of economic institutions. How institutions are measured, the direction of causality and the extent to which a given methodological approach is more appropriate to analyse the nature of the relationship has been a matter of debate in the existing literature (Straub, 2000; Kaufmann et al, 2010; Chang, 2010; Maseland, 2011; Albouy, 2012; Alonso et al, 2013 and Vogit, 2013). Therefore, the aim of this section is to discuss the methodological approaches in the existing literature in order to inform our own approach.

Research related to the determinants of institutional quality takes a positivist (quantitative) or interpretivist (qualitative) perspectives (Aoki, 2007 and Creswell, 2009). The interpretivist perspective argues that research involved developing subjective meanings of one's experiences of the world (Creswell, 2009). Therefore, the researcher's subjective perception could not be separated from the research. Hence, generalizations could be subjected to bias outcomes. Some papers argue that the descriptive approach to research related to the determinants of institutional quality is plausible given that institutional quality indices are computed from subjective survey data that could be bias to changes in economic and political situations (Castellano et al, 2012). This approach has been used in the existing literature and they have provided valuable insights into the type of variables that could be relevant in estimation (North, 1990; Maki et al, 1993; Hodgson, 1998; Rodrik and Subramanian, 2003; Rodrik, 2007; Chang, 2010; Albouy, 2012; Castellano et al, 2012 and Vogit, 2013).

Nonetheless, some papers argue that the descriptive approach in this area of research should be treated as a first step toward a positivist perspective (Koremenos et al, 2001 and Acemoglu et al, 2001). Therefore, the positivist (quantitative) view is increasing its presence in this area of research. The positivist perspective postulates that social phenomenon could be captured better and trusted if our observations are measured in order to find causal relationships (Crewsell, 2009 and Saunders et al, 2012). Hence, the role of the researcher is to observe and interpret the observed and that the researcher should be separated from the research. This proposition naturally implies that the positivist perspective prefers the use of quantitative method of research. Hence, models should be derived in order to provide estimates that could be interpreted. Thus, the positivist perspective is aligned with the conceptual approach to modelling. Nonetheless, the quantitative approach to research about the determinants of institutional quality is ongoing with no strong link between modelling and institutional theory mainly due to the issue of endogeneity. We cited Acemoglu et al (2001) and Koremenos et al (2001) earlier that research in this area should start with building theory first, followed by models and subsequently estimation. The theories of institutions have been established in the existing literature although the link to models and estimation is limited due to endogeneity.

We argue that endogeneity could not be eliminated entirely in research related to institutions although it could be minimized by identifying appropriate proxies or include lag of the dependent variable as an independent variable. Some papers proposed the use of initial values as proxy for the lag (Straub, 2000; Islam and Montenegro, 2002; Kandil, 2009 and Alonso et al, 2013).

The structure of the section is as follows. First, a review of the existing modelling and estimation methods in section 5.3.1. Section 5.3.2 will discuss the conceptual model specification about the determinants of institutional quality. In section 5.3.3 we will discuss the estimation method that is going to be used while section 5.4 will discuss the variables that are going to be used to estimate the model.

5.3.1 Review of models and estimation techniques

As we highlighted earlier, research related to the determinants of institutional quality used either a descriptive or statistical approach. The descriptive approach assumes that socioeconomic, political and cultural factors determine the rules that govern how things are done (North, 1990). The justification for using this approach is that it is difficult if not impossible to capture the complexities of the determinants of institutional quality in a single equation. Furthermore, institutional quality cannot be measured quantitatively because they are applied contextually nor are they easily amendable. Therefore, what we should do is to identify patterns where the quality of institutions is associated with changes in socioeconomic factors (Subramanian et al, 2003; Bloch and Tang, 2004; Moss et al, 2006 and Rodrik, 2007). Nonetheless, research in this area is increasing skewing toward estimation.

However, the estimation approach suffers from three issues that pose difficulty, namely; the lack of models underpinned by institutional theories, lack of consensus about appropriate estimation method and the extent to which the direction of causality is explained. Indeed, Chang (2010) argued that research in this area usually collapses in the modelling stage mainly due to the difficulty in identifying all the mechanisms on how institutions works and how to address endogeneity issue. Chang (2010) concluded that estimates tend to measure policy effectiveness rather than institutional quality. Furthermore, papers that used the statistical approach usually describe the expected nature of relationships from a theoretical perspective and then use the method of least squares for estimation. This process does not justify the direction of causality.

Other papers that modelled determinants of institutional quality did not estimate them, although it is a step toward finding an appropriate estimation method (Rosendorff and Milner, 2001 and Hodgson, 2006). Their view is identical to the descriptive approach that recognises the difficulty to establish the direction of causality. Another issue with the statistical approach is the lack of consensus in the use of an appropriate estimation method. Apart from the descriptive approach, several techniques have been used, including correlation test, ordinary least square (OLS), weighted least square (WLS) and two-stage least square (2SLS) as demonstrated in table 5.1 above. The correlation test approach recognises the difficulty to establish causality in research related to the determinants of institutional quality. Correlation tests the degree of association between two variables (Chong et al, 2000 and Kandil, 2009).

We argue that correlation could be used in tandem with estimation techniques in order to further our understanding of the determinants of institutional quality using OLS, WLS or 2SLS (Chong et al, 2000 and Kandil, 2009). Some papers used two estimation techniques with a view to determine the robustness of their results within the least square method (Straub, 2000; Treisman, 1998; Islam et al, 2002; Brunetti and Weder, 2003). Other papers use three to four averages in order to establish robustness of results within the least square estimation technique. The premise of the least square estimates is to minimize the residual sum of square (RSS) (Gujarati, 2006; Gujarati and Porter, 2009 and Wooldridge, 2013). That is,

$$\mathrm{RSS}_{\mathrm{ki,t}} = \sum_{\mathrm{k=1}}^{\mathrm{K}} \mathrm{e}_{\mathrm{ki,t}}^{2} \qquad (5.7)$$

$where;$

$\mathrm{RSS} = \mathrm{RSS\ of\ variable\ k\ of\ country\ i\ at\ time\ t\ and}$

$\mathrm{k} = 1 \ldots, \mathrm{K\ number\ of\ residuals\ from\ the\ variables\ of\ country\ i\ at\ t\ periods}$

Equation 5.7 states that RSS is equal to the summation of the squared residuals e_{it}^{2} –the difference between actual and predicted values of the dependent variable. Small residuals whose values are closer to zero imply goodness of our model and validity of the independent variables in determining the quality of institutions.

The general form of a panel OLS is represented in equation 5.8 below,

$$\mathrm{IQ}_{\mathrm{i,t}} = \mathrm{b}_0 + \mathrm{b}_1\mathrm{Econ}_{\mathrm{k,it}} + \mathrm{e}_{\mathrm{k,it}} \qquad (5.8)$$

Where;

$\mathrm{IQ}_{\mathrm{i,t}} =$ institutional quality indices of country i at time t ,

$\mathrm{Econ}_{\mathrm{ki,t}} =$ vectors of k variables of country i,

$\mathrm{e}_{\mathrm{ki,t}} =$ the error term

Since IQ and Econ are known, the partial derivative finds values of b_0 and b_1 that minimises RSS. The larger the coefficients, the smaller RSS will be. The partial derivative of an OLS regression implies that we want to know the impact of a change in one independent variable on the dependent variable by holding all the other independent variables constant. This allows us to identify which variable significantly determine IQ relative to the others.

However, there are fundamental assumptions that should be satisfied before OLS could be used. First, if we cannot hold all the other variables constant in order to determine the rate of change of institutional quality brought about by a change in one of the independent variables, then 5.8 suffers from multicollinearity that make our estimates inconsistent and unreliable. Nonetheless, research related to the determinants of institutional quality does not consider the importance of multicollinearity because they assume that most of the variables are already endogenous. Therefore, their main emphasis is to consider the degree of autocorrelation (Gujarati, 2006 and Wooldridge, 2013). OLS assume that the variance of the error term $var(e_{ki,t}) = \alpha^2$ is constant for all k of i and the average value of the error term$(\mathrm{e}_{\mathrm{ki,t}}) = 0$. If this is not satisfied, then simple OLS could not be used. Research related to the determinants of institutional quality could not capture all the conjunctions of factors that determine institutional quality in a single equation with parsimony (Chang, 2010 and Vogit, 2013). Therefore, the assumption that the error term is zero could not hold which implies the presence of endogeneity.

Similarly, the quality of institutions may not be the same across countries. There could be an outlier country whose contribution to the error term could be greater or smaller. This means that the weight of each observation is not identical, thus skewing the error estimate toward the outlier. Since the outlier is not clustered around the mean of the other observations, our predictions would be difficult to rely upon. Therefore, OLS alone could not be used. As a result, many papers transform the data in order to use WLS or 2SLS (Straub, 2000 and Islam and Montenegro, 2002).

WLS and its associated generalized least squares (GLS) transform data where the independent variables are heteroskedastic (when the error term is non- constant) and then apply OLS to the transformed data. If the variance of the error term is knownσ^2, then we use weighted least squares. The process involved minimizing the weighted sums of square rather than the RSS. However, WLS does not correct endogeneity that has made research in this area difficult to model and estimate. As a result, some papers used 2SLS.

As the name implies, 2SLS involved two steps of estimation. The first stage involved looking for an instrumental variable as a proxy for the independent variable that is not correlated with the error term but correlated with the variable for which endogeneity is identified. There are several ways of identifying suitable instrumental variable. Kandil (2009) ran regression twice. First, ran a regression to generate proxy for the independent variable in question by using its lagged and then use the predicted estimate in place of the original figure to run the second regression with OLS. The intuition, according to Kandil (2009) is that lagged variables are unlikely to be correlated with the error term. Alonso et al (2013) also used lagged independent variable as proxies because it is assumed that they are uncorrelated with the error term. The other method is to choose an instrument for the variable assumed to be endogenous. The challenge is to find a suitable instrument as it must satisfy certain conditions. First, the instrument must not be correlated with the dependent or the disturbance term but correlated with the independent variable. Second, the instrument must only influence the dependent variable through the independent variable assumed to be exogenous (Islam and Montenegro, 2002; Brunetti et al, 2003; Gujarati, 2006; Herger et al, 2008 and Wooldridge, 2013). Acemoglu et al (2001) used European mortality rates in former colonies as a proxy for past institutional quality in their paper that estimated determinants of current institutional quality. However, the fundamental criticism of using instruments is whether the instruments are a good proxy for the variable and whether they have strong estimation power (Chang, 2010; Shepherd, 2010 and Albouy, 2012).

Based on the institutional theories discussed earlier, repeated interactions of agents lead to the emergence of norms that could constitute institutional quality. Therefore, both past and current behaviour contain useful information in explaining the current quality of institutions and models should capture this relationship. Hence, endogeneity could never be removed entirely in this area of research. As such, we need to justify a model base on what the researcher intends to achieve.

5.3.2 Conceptual model specification

We highlighted in section 5.1 that institutional theories predict that the quality of institutions is determined by repeated interaction of agents and the capacity of the state to enforce agreements. Interaction is measured through exchanges and cooperation. We could apply a similar argument in the context of RTAs where the repeated interactions of countries through bilateral trade and other factors determine the quality of institutions. Furthermore, we argue that repeated interaction of countries motivates the demand for better institutions in order to smooth future transactions within an RTA. Several events were cited in the existing literature that repeated interactions provides motivation to create and improve trade facilitation institutions (Milgrom et al, 1990 and Grief et al, 1992). These assumptions could be used to justify and guide our modelling and inform the direction of causality.

Assumption 1

The quality of institutions exists when they are demanded by stakeholders. In the literature, we provide examples where repeated interaction led to the creation and improvements of trade facilitation institutions such as;

a) The champagne fairs of the 12th and 13th centuries in the UK, which created merchant courts to facilitate trade and settle trade disputes (Milgrom et al, 1990),

b) European medieval merchants demanded their governments to protect trade routes between Europe and other regions which represents the regulation of cross-border trade (Grief et al, 1992) and

c) Trade and other economic exchanges helped create institutions in ancient Venice- 800-1350 which facilitated trade (Puga and Trefler, 2012).

Therefore, if such events hold, then repeated interactions determine the quality of institutions unidirectionally before they in turn influence future interactions. Gujarati and Porter (2009) lamented that time does not go backward. As such, if event 'A' happened before 'B', it is likely that 'A' causes 'B' either over time or instantaneously. Hurwicz (1996) cited by Aoki (2007) also lamented on the difficulty or impossibility of designing rules (institutions) prior to playing the game although these statements can be subjective. For example, the rational expectation theory assumes that instantaneous influences could occur if agents adjust their future expectations to be realized in the present period. Nonetheless, this is unlikely in the context of institutional quality since institutions are sticky. Therefore, we could justifiably establish that repeated interactions of countries provide stimulus and demand to improve the quality of institutions in the context of RTAs, including a common currency, common procedures to enforce contracts and regulation of cross-border trade. It wouldn't make economic sense to improve institutions across countries without any interaction given the cost associated with altering each country's institutions to meet regional requirements. Hence, a causal chain can be described in equation 5.9 and 5.10 where;

$$\mathrm{Econ}_{t1} \rightarrow \mathrm{IQ}_{t2} \rightarrow \mathrm{Econ}_{t3} \rightarrow \mathrm{IQ}_{t4} \rightarrow \mathrm{Econ}_{tn} \qquad (5.9)$$

Or equivalently

$$\mathrm{IQ}_{t2} = \mathrm{f}(\mathrm{Econ}_{t1}) \qquad (5.10)$$

Where;

Econ_{t1} represent exchanges in the first and subsequently in the 3rd and n period

IQ_{t2} is institutional quality after the exchanges and subsequently in IQ_{t4}.

Equation 5.10 states that current institutional quality (IQ) is determined by past behaviour of the variables assumed to influence it. This clarifies the direction of causality at least in the initial stages.

The notion of causality has been extensively debated as to whether it is ever possible to demonstrate that changes in one or more variables causes changes in another variable (Bunge, 1961; Hume, 1975, Shadish et al, 2002 and Cartwright, 2007). Diebold (2007) argued that the term causality is used to save space; hence we should be saying that independent variables contain useful information in predicting dependent variables. Therefore, research into the determinants of institutional quality could minimize endogeneity as best as possible but could not be eliminated entirely. Indeed, Easterly and Levine (2003) argued that we cannot remove endogeneity entirely in this area of research. All we do is to find out how useful some variables are in explaining institutional quality.

Endogeneity itself has two dimensions. First, when some independent variables are correlated with the error term, then our regression equation suffers from omitted variable bias (Shepherd, 2013; Jaccard and Jacoby, 2012 and Wooldridge, 2013). Second, endogeneity takes the form in Eq. 5.11 where Econ caused IQ; IQ also causes Econ which is referred to as reverse causality or simultaneity (Shepherd, 2010 and Wooldridge, 2013).

$$Econ \rightleftarrows IQ \tag{5.11}$$

While omitted variable bias can be corrected by adding the relevant variables once they are identified, reverse causality is more difficult to correct because it is difficult to predict the exact direction of causality. The Granger causality has been used to test bidirectional causality. But this is limited to a test rather than an estimation.

Therefore, the key to assumption one in the context of RTAs is that past behaviour of IQ could be used as an independent variable to estimate how past behaviour influence current institutional quality. It is assumed that lag IQ would capture all past interactions. Some papers used initial values instead of lags with the assumption that lags are weak instruments especially when they are sticky (Alonso et al, 2013).

Assumption 2

The second assumption argues that countries are the main negotiators and enforcers of regional agreements, including the setting up of institutions that are binding in an RTA. Hence, we do not consider individual traders and investors in our model as specified by Levechenko (2012). Instead, it is assumed that the individual government's desire to improve quality of institutions depend on the extent to which traders and investors lobby governments to do so. Therefore, the capacity of the state is important in models that seek to explain the determinants of institutional quality (Raiser et al, 2001 and Alonso et al, 2013).

With these assumptions, we are now ready to specify a model underpinned by institutional theories in the context of RTAs using ECOWAS as a new case study.

5.3.2.0 Model specification

A recap of the basis of the theoretical discussions and the assumption we made in section 5.3.2 suggest that the quality of institutions of country i is a function of its k indicators and the past behaviour of IQ in a closed economy. Symbolically, this is represented in equation 5.12 below;

$$\mathrm{IQ}_{i,t} = f\left(\sum_{k=1}^{K} \mathrm{Econ}_{ki,t} + \mathrm{IQ}_{i,t-p}\right) \qquad (5.12)$$

Where

$\mathrm{IQ}_{i,t} =$ institutional quality indices of country i at time t ,

$\mathrm{Econ}_{ki,t} =$ is vector of k variables of country i at time t

$k = 1, \ldots, K$ number of variables

$p =$ number of lags

Equation 5.12 states that ‘Econ’ of country i contain useful information in predicting institutional quality (IQ) (Musole, 2009; Buitelaar and Needham, 2007 and Berggren and Bjornskov, 2012). Furthermore, past IQ also contain useful information in predicting current IQ (Acemoglu et al, 2001; Easterly and Levine, 2003 and Nunn, 2008). We note here that IPE also assume that institutions are determined first before they in turn facilitate future exchanges (Zweynert, 2009 and Castellano et al, 2012). Hence, 5.12 hold for both NIE and IPE and that past IQ gives it a path dependent nature (Javed, 2013).

In an open economy, country i interacts with other partners we called j. Partner j’s IQ is also determined by its domestic Econ and the past value of their IQ in the same way as i which is represented in equation 5.13 below.

$$\mathrm{IQ}_{j,t} = f\left(\sum_{k=1}^{K} \mathrm{Econ}_{kj,t} + \mathrm{IQ}_{j,t-p}\right) \qquad (5.13)$$

Since past IQ is determined by past Econ, then past IQ would partially capture the extent to which past Econ indicators influences current IQ via past IQ. Therefore, including past IQ as a dependent variable captures the historical determinants of institutional quality.

In the context of RTAs like ECOWAS aspiring to standardise their institutions, the quality of each country's institution is assumed to be a function of its domestic factors, past IQ and the quality of institution of its partners.

Therefore, the basic model specified in equation 5.14 depict that the quality of institutions (IQ) of country i is determined by current k indicators, its past IQ and the IQ of its partners j countries. The inclusion of partner j's IQ as independent variable means that it serves as pull factor for i. That is, improvement in partner j's IQ would stimulate i to improve its IQ. Moreover, equation 5.14 also represents the extent to which best practices could be learn from one another. Symbolically;

$$\mathrm{IQ_{i,t}} = \mathrm{f}\left(\mathrm{Econ_{ki,t}} + \mathrm{IQ_{i,t-p}} + \mathrm{IQ_{j,t}}\right) \quad (5.14)$$

Where;

$\mathrm{IQ_{i,t}} =$ institutional quality indices of country i at time t ,

$\mathrm{Econ_{i,t}} =$ is vector of k variables of country i at time t

$\mathrm{p} =$ number of lags and

$\mathrm{IQ_{j,t}} =$ IQ of partner countries

In the context of ECOWAS with 15 countries, partner j could be a parameter for each country or V-i representing the rest of ECOWAS IQ of partner 'j'. Alternatively, the average value of V-i could be used to represent partner j IQ. Since the sum of the value of IQ of V-i should be greater that each individual ECOWAS member, we take the sum of V-i as partner j IQ. Equation 5.14 is reasonable to assume in the context of an RTA aspiring to standardise their institutions because it generates some degree of interdependence between nations.

Equation 5.14 is only an identity model. Hence, it will be transform into an econometric model to allow estimation. This will be discussed in the next section.

5.3.3 Estimation method

The main aim of this section is to justify how to estimate equation 5.14 and to specify the convergence model. As we highlighted in section 5.3.1, method of least squares is the main estimation technique used in this area of research mainly with cross-sectional data. Instrumental variables through 2SLS is used to minimise endogeneity. Lags of IQ or initial values of IQ has been used as instruments or as independent variable. The assumption is that using appropriate instruments or lag IQ could minimise endogeneity. ECOWAS consists of 15-member states and the IQ data span from 1996 to 2015. This means that our data is treated as a panel data.

There are two strands of estimating panel data. The first strand recognized heterogeneity, serial correlation and heteroscedasticity of the data which is corrected first before least square is applied for estimation (Washington et al, 2003; Baltagi, 2005; Gujarati, 2006 and Reyna, 2007). The second strand used time series methods by worrying about nonstationarity, cointegration and spurious regression which is tested and corrected before the use of the autoregressive method of estimation (Baltagi, 2005).

The inclusion of lagged independent variables suggests the feasibility to use vector-autoregressive (VAR) model conditional on stationary and uncorrelated panel data. Furthermore, VAR models are ideal to estimate a short-run process. Nonetheless, VAR have not been used in this area of research because it is mainly concerned with estimating the extent to which unexpected changes in policy such as monetary policy lead to shocks in the economy (Sims, 1980). Therefore, we could omit some variables that may be relevant in determining the quality of institutions in ECOWAS such as colonial heritage and belonging to a monetary zone dummy.

Therefore, the feasible option is to use the other strand in panel data by worrying about autocorrelation and heteroscedasticity. The least square method is complicated by the inclusion of lagged IQ as an independent variable since it is likely to be correlated with the error term (Baltagi, 2005; Greene, 2008 and Wooldridge, 2013). An alternative approach is to include language dummies to capture lagged IQ in the context of West Africa or use initial value of IQ (1996 IQ for all the years). Nonetheless, the inclusion of lagged IQ as an independent variable could be exogenous (basic assumption of least squares) if the data is stationary (Heij et al, 2004; Diebold, 2007 and Gujarati and Porter, 2009). Moreover, our basic model assumes that the inclusion of IQ as an independent variable is plausible because past IQ could contain memory in explaining current IQ especially if the rate of change is sticky. Therefore, we would test autocorrelation and stationarity of our dataset in order to allow convergence test and to estimate determinants of institutional quality. However, the time span of the dataset is small to effect strong unit root test. Therefore, although stationarity test will be conducted, caveats that it might be weak due to the small-time span. Furthermore, the small-time span of the dataset means it impossible to deduce a strong conclusion in the unit root for individual ECOWAS members.

5.3.3.0 Estimation method- determinants of institutional quality

Equation 5.14 is restated in equation 5.15 below;

$$\mathrm{IQ}_{i,t} = \beta_0 + \beta_1 \mathrm{Econ}_{ki,t} + \beta_2 \mathrm{IQ}_{i,t-p} + \beta_3 \mathrm{IQ}_{j,t} + \varepsilon_{i,t} \quad (5.15)$$

Where;

$\mathrm{IQ}_{i,t} =$ institutional quality indices of country i at time t ,

$\mathrm{Econ}_{i,t} =$ is vector of k variables of country i at time t

$\mathrm{IQ}_{j,t} =$ IQ of partner countries (V-i partner countries in ECOWAS)

V= Total number of ECOWAS countries.

$\beta's =$ parameters or coefficients

$p =$ number of lags and

$\varepsilon_{i,t} =$ error term

Equation 5.15 contain an error term $\varepsilon_{i,t}$ and beta β parameters which transformed it into an econometric model that could be estimated. The error term captures all the unobservable factors or omitted variables in the model (Heij et al, 2004; Gujarati and Porter, 2009 and Wooldridge, 2013). The $\beta's$ are usually the main interest of a researcher because it measures the extent to which an independent variable contain useful information in explaining the dependent variable by holding all the other independent variables constant.

Equation 5.15 exhibits some characteristics that could make the use of least square difficult without further qualifications. First, the equation could suffer from autocorrelation. Autocorrelation can manifest itself in many ways. First, if Econ is correlated with the error term, then they suffer from omitted variable bias. In this case, we can add the relevant variables or create a latent variable to correct or minimize the omitted variable bias (Gujarati and Porter, 2009 and Wooldridge, 2013). However, it is difficult if not impossible to eliminate omitted variable bias in research relating to the determinants of institutional quality with parsimony since there are so many factors (observable and unobservable) that can be considered. Control variables have been proposed in the existing literature to capture variables that are not directly included in the estimation models if they are present in all the observed panels (Rose, 2005; Reyna, 2007; Greene, 2008 and Javed, 2013).

The basic assumption of least square estimates is no autocorrelation, which is represented in equation 5.16 below. Therefore, we need to test it in order to correct it.

$$\text{corr}\ (\text{Econ}_i, \varepsilon_i) = 0 \qquad (5.16)$$

Secondly, autocorrelation occurs if the error term of one country is correlated with that of another, we say that spatial correlation (correlation in space) exists (Baltagi, 2005 and Wooldridge, 2013). That is, we want equation 5.17 to hold so that no spatial correlation exists.

$$\mathrm{corr}\left(\varepsilon_i, \varepsilon_j\right) = 0 \quad i \neq j \tag{5.17}$$

Spatial correlation is more prevalent in time series than in panel data and it can be difficult to correct (Wooldridge, 2002 and Wooldridge, 2013). Nonetheless, it could exist in panel data if the observations are not independent. In such cases, it would be difficult to ascertain the extent to which the error of i or j influences institutional quality. In ECOWAS, it is likely that factors that are not economic such as political cooperation can influence institutions in which case 5.17 does not hold. Third, and perhaps the most important aspect of autocorrelation that has made empirical research in institutional economics difficult is endogeneity (reverse causality) (Shepherd, 2010). Endogeneity arises through bidirectional means where 'IQ' determines Econ*;* Econ also determines 'IQ' (Borner et al, 2004; Chang, 2010; Shepherd, 2010; Wooldridge, 2013 and Alonso et al, 2013). Symbolically, if;

$$\mathrm{IQ}_{i,t} = \sum_{k=1}^{K} \mathrm{Econ}_{ki,t} + \varepsilon_{i,t} \tag{5.18}$$

And

$$\sum_{k=1}^{K} \mathrm{Econ}_{ki,t} = \mathrm{IQ}_{i,t} + \varepsilon_{i,t} \tag{5.19}$$

Then, current Econ depend on IQ; Econ must be influenced by shocks to IQ, which means that Econ is correlated with ε. Regressions generally assume no autocorrelation in any model specification either in space or time. Therefore, we should perform panel autocorrelation tests to make the necessary data transformation.

One solution to endogeneity per Engel and Granger (1987) is to use lags of the variables in a multiple equation model where autoregressive models such as VAR estimation technique is used. However, as we highlighted earlier, VAR models are not ideal in the presence of dummies.

Nonetheless, the inclusion of lagged IQ means we cannot assume strict exogeneity in the model although it captures the path dependent characteristics of current IQ. Some papers have proposed solutions to this. Some papers suggested the use of proxies of lagged IQ as an instrument provided it influences IQ only through its lag (Acemoglu et al, 2001 and Kandil, 2009). Other papers used the initial values of IQ (IQ_{i0}) as an independent variable instead of lagged IQ. By contrast, a time variable could be created that captures whether IQ would have changed regardless of the observed variables in the model. Acemoglu et al (2001) used European mortality rates as a proxy for lagged IQ. For ECOWAS, a language dummy could also be used as proxy for lag IQ because of the regions Empirehood and colonial history that may contain memory in explaining current institutional quality. Our aim is to test for stationarity and then make the necessary transformation in order to enable us to use OLS. Endogeneity cannot be removed entirely in estimating determinants of institutional quality. Therefore, we are only estimating the extent to which some variables contain useful memory in explaining current IQ.

Furthermore, additional variables such a dummy for the 1993 revised ECOWAS treaty and belonging to a West African monetary zone could also be relevant. Therefore, the main equation that we intend to estimate is an extended version of 5.15 specified in 5.20 below.

$$\mathrm{IQ}_{\mathrm{i,t}} = \beta_0 + \beta_1 \mathrm{Econ}_{\mathrm{ki,t}} + \beta_2 \mathrm{IQ}_{\mathrm{i0}} + \beta_3 \mathrm{IQ}_{\mathrm{j,t}} + \beta_4 \mathrm{W}_{\mathrm{ki,t}} + \varepsilon_{\mathrm{i,t}} \qquad (5.20)$$

Where;

$\mathrm{IQ}_{\mathrm{i,t}} =$ institutional quality indices of country i at time t ,

$\mathrm{Econ}_{\mathrm{ki,t}} =$ is vector of k variables of country i at time t

$\mathrm{IQ}_{\mathrm{i0}} =$ the initial value of IQ which is 1996 values for each country

$\mathrm{IQ}_{\mathrm{j,t}} =$ IQ of partner countries ($\mathrm{V} - \mathrm{i}$ partner countries in ECOWAS)

$\mathrm{V} =$ Total number of ECOWAS countries.

$\beta's =$ parameters or coefficients

$\varepsilon_{\mathrm{i,t}} =$ error term

$\mathrm{W}_{\mathrm{ki,t}} =$ dummies such as belonging to WAMZ or WAEMU and language

The intention is to estimate 5.20 first. We will then drop the independent IQ's and replace them with language dummy as proxy for past IQ. We will first test panel autocorrelation and stationarity before estimating equation 5.20.

5.3.3.1 Estimation method- process of convergence

The thesis will also examine the extent to which the quality of institutions exhibits convergence in the ECOWAS region. This is plausible because ECOWAS aims to establish common regional institutions in the quest for economic and political union. Moreover, we expect regional institutions to be common in the RTA if they are going to promote regional cooperation, integration and development through trade expansion (Fafchamps, 2004 and Helble, 2012 and Lejarraga and Shepherd, 2013). As we highlighted in chapter two, we argue that we could extend the convergence of income and price within trade theory to test the process of convergence of institutions. Ben-David (1996) offered a simple convergence test of income and price for trade partners that we adopt, and it is represented in equation 5.21.

$$(\mathrm{IQ}_{i,t} - \overline{\mathrm{IQ}}_{i,t}) = \emptyset\,(\mathrm{IQ}_{i,t-1} - \overline{\mathrm{IQ}}_{i,t-1}) + \varepsilon_{i,t} \qquad (5.21)$$

Where

$\mathrm{t} = \text{time in years}$

$\mathrm{IQ}_{i,t}$ is log of the institutional quality,

$\overline{\mathrm{IQ}}_{i,t}$ is average institutional quality of the sample and

$\mathrm{IQ}_{i,t-1}$ is the lag of the log institutional quality indices

$\overline{\mathrm{IQ}}_{i,t-1}$ is the average of the lag

The half-life convergence rate adopted by Ben-David (1996) is given in (eq.5.22);

$$\text{half life convergence} = \frac{\ln(0.5)}{\ln(\emptyset)} \qquad (5.22)$$

The half-life convergence measures the number of years (half-life) it takes before the differences in IQ are halved. We highlighted earlier that OLS could give efficient estimates if the data is stationary (Sims, 1980; Gujarati and Porter, 2009 and Wooldridge, 2013). A value $\emptyset$<1 in equation 5.21 implies convergence among trading partners while a value greater than 1 implies divergence. As highlighted earlier, convergence test requires data to be stationary. Nonetheless, the small sample size means that the stationary test may not have strong estimation power although the Levin–Lin–Chu panel unit root test could cater for small panels and small-time periods (Baltagi, 2005). However, a 30-year time span is recommended (Baltagi, 2005 and Stata Manual Guide, 2013). Nonetheless, we will perform a panel unit root test and for individual countries.

In summary, equation 5.20 and 5.21 are the focus of interest to be estimated. The main proposition in equation 5.20 is that the quality of institutions is a function of some k Econ indicators, its past IQ, the IQ of its regional trade partners and control variables such as belonging to a monetary zone. We will drop the independent IQ and replace it with a language dummy since they can both represent the same thing. Equation 5.21 test the process of convergence of institutional quality in the ECOWAS region by measuring the extent to which the variance of IQ could be explained by its past variance. In the next section, we look in more detail the data that is going to be used to estimate the two equations.

5.4 Variables and Data

5.4.0 Introduction

So far, we derived a model in section 5.2.2 and then discussed the method that is going to be used to estimate the model in section 5.3.3. The aim of this section is to discuss and justify the variables that are going to be used to estimate the determinants of institutional quality and the process of convergence. We will also discuss how some of these variables are computed and how to deal with missing values and the process of shifting or rescaling variables. We will first discuss the independent variables followed by a discussion of the institutional quality indices (dependent variables). As we highlighted in section 5.2, more than twenty variables have been used in estimating the determinants of institutional quality. This raises two issues about estimation. Using all the twenty variables brings less parsimony which consumes the degree of freedom. A higher degree of freedom (n-1) implies that we are less likely to reject a null hypothesis. In contrast, excluding relevant variables leads to omitted variable bias. One way of accommodating the two issues is to include variables that are supported by the institutional theories we discussed and are also relevant in the context of ECOWAS.

Our theoretical discussion in section 5.1 suggested that countries could standardize and improve the quality of their institutions conditional on perceived economic benefits. These benefits are realized through trade, investment, and development. From the NIE point of view, trade, investment and development characterises repeated interaction between countries which ultimately lead to demand for better institutions in order to smooth future transactions. Indeed, these three variables have been used consistently in the existing literature on the determinant of institutional quality (Islam and Montenegro, 2002; Fafchamps, 2004 and Borner et al, 2004). Moreover, we also highlighted that the IPE predicts that state capacity is important in determining the quality of institutions because they are the enforcers of contracts (North, 1990; Raiser et al, 2001; Borner et al, 2004, Siba, 2008 and Alonso et al, 2013).

Therefore, we intend to use these four variables- trade, investment, development, and state capacity as the main independent variables, although trade could be argued to be the most important. There are other variables that could be important in the context of RTAs and ECOWAS such as the effect of the formation of the RTA on the quality of institutions, the effect of the current monetary zones and its colonial past.

We will discuss each of these variables in more detail.

5.4.1 Development- The human development index (HDI)

Existing research within institutional economics generally used GDP per capita as a proxy for the level of development. Related variables including education, health and population have been used as additional variables. Nonetheless, we could bring together these variables into a composite value that represents the level of development. The human development index (HDI) has been computed on this basis. The HDI is a composite index derived from the geometric mean of normalized indices from three dimensions, namely income per capita, life expectancy at birth (in years) and the level of education (mean years of schooling and expected years of schooling) (UNDP Human Development Report Technical Notes, 2013). So far, no papers have used the HDI as a proxy for the level of development despite its plausibility.

The justification for using the HDI as a proxy for the level of development hinges on two aspects. First, it leads to parsimony because it brings together three indicators which have been found to be statistically significant in determining institutional quality (La Porta, 1999; Straub, 2000; Islam and Montenegro, 2002; Alonso et al, 2013 and Berggren et al, 2013). Secondly, development comes with better living standards, rising incomes and economic transactions which could lead to demand for more foreign goods (Islam and Montenegro, 2002; Moss, 2006 and Stefanadis, 2010). If regional trade is subjected to high trade costs, regional traders would demand their removal to remain competitive with foreign goods. Rodrik et al (2004) and Herger et al (2008) found that rising incomes improves institutional quality because it can promote cross-border investment, trade and competition. Therefore, the income dimension is plausible to use.

The other dimensions of the HDI have also been used in determining institutional quality. For example, the life expectancy dimension is associated with longevity, good nutritional intake and less diseases (HDR, 1990; Islam and Montenegro, 2002; Easterly and Levine, 2003 and Rodrik, 2007). Furthermore, a healthy population is more economically productive which feeds into greater economic transaction and subsequently, demand for better institutions that remove uncertainty, lower transaction costs and coordinate future market transactions (Subramanian et al, 2000; Straub, 2000; Acemoglu et al, 2005, and Siba, 2008). Easterly and Levine (2003) argued that people living in tropical hot weather are less economically productive due to diseases and germs which lowers demand for good institutions. Therefore, the life expectancy dimension measures geography and health status. Life expectancy at birth (in years) measures the average number of years a newborn infant would live (World Development Indicators Database, 2015).

The educational dimension is also assumed to determine institutional quality because educated societies are likely to demand better institutions and are difficult to corrupt because they would know their rights under trade agreements (Straub, 2000 and Borner et al, 2004). In addition, a highly educated population would be able to foster and abide by consensual rules that govern society while demanding their rights under ECOWAS protocols. Therefore, using the HDI as a proxy for the level of development is more appealing than per capita income because it includes other dimensions that have been found to determine institutional quality.

Nonetheless, the HDI indices are not comparable across years because the data used to compute them differ from one period to another (Human Development Report (HDR), 2009). Therefore, we derive our own composite HDI using the UNDP methodology (UNDP HDI Report, 2014). Differences in the use of variables mean we should consider data availability and to justify which set of variables we should use. Table 5.2 below shows the number of times each indicator has been used to compute the HDI since it was first launched in 1990. The life expectancy data have been used in all the years. It is readily available from the world development indicators database for all ECOWAS countries from 1996 to 2015. Hence, it does not provide difficulty in justifying its use.

Table 5.2 Number of time variables are used to compute the HDI

Indicator	Times used (years=1990-2014	Percentage used
Life expectancy at Birth (years)	25	100
GDP per capita (PPP US$)	20	80
Adult literacy rate (+15 above)	20	80
Gross enrolment ratio	15	60
Mean years of schooling	10	40
Expected years of schooling	5	20

Source: Authors computation. The computation of the HDI started in 1990 and it has been computed annually since then.

With regards to the income and education dimension, several variables have been used. For example, the income dimension has used two sets of variables since 1990 namely, GDP per capita and GNI per capita with and without PPP. The GDP per capita is more readily available for all ECOWAS countries. Furthermore, it has been used 80% of the time as shown in Table 5.2 above. Therefore, we use GDP per capita (PPP 2011 international $) as the income dimension.

Table 5.2 also shows the number of times each education variable has been used to compute the HDI from 1990 to 2014. Although the adult literacy rate and gross enrolment ratio were used 80% and 60% of the time respectively, the mean years of schooling and the expected years of schooling data are more readily available for all ECOWAS countries. Furthermore, it is the most recent data set used to compute the HDI by the UNDP. Thus, the means years and expected years of schooling data set will be used to compute the educational dimension. However, the adult literacy rate and gross enrolment ratio were also used as a pilot to gauge whether the two HDI values would be identical. For most of the years, the HDI values were identical when the 2005 and 2013 goalpost from the UNDP was used as a benchmark. Additionally, the mean years and expected years of schooling captures literacy rates as well as enrollment rates. Mean years of total schooling, age 25+ measures the average years of education completed among people over the age of 25 which is a good indicator of literacy rates. Expected years of schooling are the number of years a child of school entrance age is expected to spend at school, or university, including years spent on repetition. It is the sum of the age-specific enrolment ratios for primary, secondary, post-secondary, non-tertiary and tertiary education (World Development Indicators Database, 2015). Nonetheless, some years are missing from the education dataset that shall be discussed in section 5.4.8.

5.4.2 Computation of the human development index (HDI)

The methodology used to compute the HDI differed from one year to another. One common feature in all the methods is that a standard goalpost was used although the values differed. Furthermore, the initial computation in each of the three dimensions used equation 5.23 below;

$$\text{Dimension index} = \frac{\text{Actual value} - \text{minimum value}}{\text{Maximum value} - \text{minimum value}} \qquad (5.23)$$

From 1990 to 2009, the simple arithmetic mean of the three dimensions was used to arrive at the final HDI. In 2010, the methodology slightly changed where the geometric mean of the three dimensions was multiplied to arrive at the final HDI. According to the 2010 Human Development Report (HDR) technical notes, the change in methodology has lowered the indices in general, although it has not made any significant difference in the overall global rankings of individual countries. Therefore, it was decided that the 2013 UNDP methodology and goalpost will be used in this chapter since it is the most current approach. To further test if the two methods will generate identical HDI indices, the old methodology was also applied using the 2005 goalpost. The 2013 methodology produced more identical indices with those computed by the UNDP. Table 5.3 shows the goalpost that was used in 2013.

Table 5.3 2013 Goalpost basis for computing the HDI index

Indicator	Maximum value	Minimum value	Country Observed)
Life expectancy at Birth (years)	83.6	20	Japan
GDP per capita (constant 2005 US$)	127562	100	Qatar
Mean years of schooling	13.3	0	USA
Expected years of schooling	18	0	USA
Combined Education Index	0.971		

Source: The 2013 UNDP HDR Technical Notes

The goalposts are based on observing the highest values recorded for an individual country in the world as a benchmark. For example, Table 5.3 show that Qatar had the highest GDP per capita in 2013 while the USA recorded the highest expected years of schooling. We use Table 5.3 goalpost to compute HDI for each ECOWAS member from 1996 to 2015. The process involves computing each dimension using equation 5.24 to 5.28 to arrive at the final HDI index in equation 5.29 or 5.30 respectively.

Income index $= \frac{\text{Ln (Actual GDP)} - \text{Ln}(100)}{\text{Ln}(127562) - \text{Ln}(100)}$ (5.24)

The life expectancy index $= \frac{\text{Actual} - 20}{83.6 - 20}$ (5.25)

Mean years of schooling (+25 years) $(\text{A}_1) = \frac{\text{Actual} - 0}{13.3 - 0}$ (5.26)

Expected years of schooling $(\text{A}_2) = \frac{\text{Actual} - 0}{18 - 0}$ (5.27)

Education index $= \frac{\sqrt{\text{A}_1 * \text{A}_2} - 0}{0.971 - 0}$ (5.28)

HDI index = $3\sqrt{\text{income} * \text{life expectancy} * \text{education}}$ (5.29)

Or equivalently,

HDI = $\{\text{income} * \text{life expectancy} * \text{education}\}^{0.3333}$ (5.30)

5.4.3 Trade data

As we highlighted in the previous sections, trade is an important determinant of institutional quality. The argument is that countries that open their markets to international trade attracts competition, investment as well as learn best practices from one another (Rodrik and Subramanian, 2003). Domestic firms that face competition from foreign firms will lobby their governments to develop better institutions to help minimize trade costs and to exploit their comparative advantage. At the RTA level, more trade leads to demand for better harmonized institutions since weak institutions levy high transaction costs, uncertainty and coordination failures (Islam and Montenegro, 2002; Fafchamps, 2004 and Borner et al, 2004). Indeed, our discussion in chapter three and four demonstrated that weakness in the quality of institutions levies high cost to ECOWAS cross-border trade.

Nonetheless, there is no consensus on which set of trade data should be used. Some papers used openness which measures the extent to which a country trade with the rest of the world. Several measures of openness have been proposed in the existing literature. The sum of imports and exports as a percentage of GDP is the most commonly used measure of openness (Ades et al, 1999; Straub, 2000; Islam and Montenegro, 2002; Rodrik and Subramanian, 2003; Borner et al, 2004; Rodrik, 2007; Herger et al, 2008; Mocan, 2008; Berggren et al, 2013; Lejarraga and Shepherd, 2013 and Alonso et al, 2013). Dollar and Kraay (2002) difference trade/GDP ratio as an indicator of trade liberalization policy while Sachs and Warner (1997) defined a country as open if their;

a) Average tariff rate is less than 40%,

b) Non-tariff barriers cover less than 40% of trade goods,

c) The country is not socialist,

d) The government does not control exports through marketing boards, for example and

e) The black-market premium was less than 20% during the 1970s and 1980s. The black-market premium is the exchange rate in the black market relative to the official rate. The smaller the value, the less exchange rate controls.

However, openness, as it is commonly measured does not necessarily capture how regional institutions could be determined because openness, data by computation contains trade data that is not entirely composed of regional trade data. Thus, we proposed intra-ECOWAS trade as a percentage of GDP or bilateral trade flows (US$) since it is the most likely factor that can influence the development and convergence of institutions at the regional level (Yansane, 1977; Ellis and Mogan, 1984, Omorogbe, 1993; Ogunkola, 1998, Iyoha, 2005; Spycher and Okike, 2006; Keane et al, 2010; Zannou, 2010 and Assane et al, 2014). The trade data comes from the World Integrated Trade Solutions (WITS).

The method used to compute the openness and intra-ECOWAS trade as a percentage of GDP is the same and the only difference being the type of import and export data used. The method is expressed as thus;

$$\text{openness} = \left\{\frac{(\mathrm{X}+\mathrm{M})}{\mathrm{GDP}}\right\} * 100 \qquad (5.31)$$

$$\text{intra} - \text{ECOWAS trade as \% of GDP} = \left\{\frac{(\mathrm{X}+\mathrm{M})}{\mathrm{GDP}}\right\} * 100 \qquad (5.32)$$

Where;

X is exports,

M is imports and

GDP is gross domestic product in constant 2010 US$

5.4.4 State capacity data

State capacity is fundamental in determining institutional quality since it defines states' ability and legitimacy to enforce rules and to manage different interest groups in society (Raiser et al, 2001; Borner et al, 2004, Siba, 2008 and Alonso et al, 2013). State capacity is expected to be entrenched within the cultural norms of society and the political commitment of the state to strengthen its relations with its citizenry and partners (Borner et al, 2004). Therefore, state capacity captures both cultural and political determinants of institutions which as we highlighted earlier generates parsimony.

In the context of ECOWAS, the authority of heads of states is the highest and final decision maker. Therefore, without their blessing, it will be difficult to set common regional trade rules and to facilitate the implementation of protocols.

State capacity has been measured using different variables. Raiser et al (2001) used general government expenditure as a percentage of GDP as proxy while Borner et al (2004); Moss et al (2006) and Alonso et al (2013) used total government tax revenues. The argument from both authors is that government revenue provides resources for investment in quality institutions while simultaneously ensuring a social contract between the state and the people. Similarly, government revenue dictates its ability to spend. It can also dictate the extent to which the state can withstand internal and external shocks that might be detrimental to societal welfare.

Both datasets are identical, and their percentage differences are minimal. Nonetheless, general government final expenditure as a percentage of GDP is the most readily available and covers a longer period that revenue as a percentage of GDP. Therefore, we use general government final expenditure as a percentage of GDP as a proxy for state capacity. The data come from the World development indicators database.

5.4.5 Foreign direct investment (inflows)

The three variables that were discussed in the previous sections; state capacity, trade and the level of development are assumed to be the most important determinants of institutional quality. Furthermore, we argue that FDI could also determine the quality of institutions using similar arguments with openness. That is, an increase in FDI inflows in various sectors is likely to improve institutional quality, particularly contract enforcement and property rights institutions since investors would want to have legal guarantees for the protection of their assets. In addition, FDI creates employment and other goods which could improve the quality of life of citizens that could lead to demand for better services and institutions. For example, the high FDI in the oil and the housing sector in the Middle East helped improve the provision of infrastructure development, better regulation of the housing and financial market (Kandil, 2009). FDI can also lead to greater technological and information diffusion that can trigger learning best practices from other regions that could subsequently lead to convergence of regional trade institutions.

FDI inflows have been used in several papers as an important determinant of institutional quality, particularly in Sub-Saharan Africa and the Middle East (Bloch and Tang, 2004; Herger et al, 2008; Kandil, 2009). Most papers used FDI net inflows both in value and as a percentage of GDP to estimate its impact on institutional quality (Bloch and Tang, 2004; Kandil, 2009 and Driffield and Jones, 2013). FDI outflows can also determine the quality of institutions and harmonization since they are more likely to capture intra-regional FDI. However, FDI outflow data are limited in the ECOWAS region. Thus, we utilize FDI net inflows in value and as a percentage of GDP as our variables. The data are from the United Nations Conference on Trade and Development database (UNCTADSTAT).

FDI inflows comprise three components, namely;

1. Equity capital, which is the foreign direct investor's purchase of shares of an enterprise in a country other than that of its residence,
2. Reinvested earnings comprise the direct investor's share (in proportion to direct equity participation) of earnings not distributed as dividends by affiliates or earnings not remitted to the direct investor. Such retained profits by affiliates are reinvested and,
3. Intra-company loans or intra-company debt transactions refer to short- and long-term borrowing and lending of funds between direct investors (parent enterprises) and affiliate enterprises.

Data on FDI flows are presented on a net basis (capital transactions' credits less debits between direct investors and their foreign affiliates). Net decreases in assets or net increases in liabilities are recorded as credits (with a positive sign), while net increases in assets or net decreases in liabilities are recorded as debits (with a negative sign). Hence, FDI flows with a negative sign indicate that at least one of the three components of FDI is negative and not offset by positive amounts of the remaining components. These are called reverse investment or disinvestment. The FDI data were in millions of current US$. Hence, we transformed the data into real FDI using equation 5.33 below to ensure it is measured in the same units with the other variables.

$$\text{Real FDI} = \left\{\frac{\text{current FDI}}{\text{GDP Deflator}}\right\} * 100 \qquad (5.33)$$

5.4.6 Other Variables

We highlighted earlier that other variables could be important in determining the quality of institutions such as the effect of ECOWAS. Given that ECOWAS is polarized into two monetary zones, WAMZ and WAEMU, and colonial heritage, we will look at the extent to which belonging to different monetary zones and colonial heritage influence the quality of institutions. As specified in our model, the lag of IQ could be used to represent language dummy and colonial heritage dummy. The justification for using these variables is because could have effect on the extent to which ECOWAS achieve their deep integration goals.

5.4.7 The Dependent variables (institutional quality indices)

As discussed in chapter two, several institutional quality indices have been used in the existing literature to estimate the conjunction of factors which determine them. The sources of these institutional quality indices include;

- World Economic Forum global enabling trade indices
- Country policy and institutional assessment (CPIA) of the World Bank
- Doing Business of the World Bank and
- The World Bank worldwide governance indicators

These indices are readily available and are computed using survey data where various stakeholders in society are asked about their perception of certain rules governing society. The responses from these participants are then indexed into a composite value as a proxy for the quality of an institution. The availability of data in each of these sources varies. For example, the global enabling trade indices are only available from 2008 to 2014 which offers a small sample size relative to the world governance indicators whose data spans from 1996 to 2015. Additionally, the world governance indicators are the most comprehensive proxy for institutional quality because they include data from several hundred variables generated from 31 individual data sources for each country that included some aspects of the enabling trade indices and doing business indices (Kaufmann et al, 2010 and Alonso et al, 2013). Therefore, we utilize the institutional quality indices from the worldwide governance indicators as proxies. Table 5.4 provides four of the six institutional quality indices from the world governance indicators and their definition. The indices range from -2.5 (weak) to 2.5 (strong) presence of governance.

Table 5.4 Institutional quality indices (dependent variables)

Institutional quality indices	**Definition**
Government Effectiveness	Capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.
Regulatory quality	Capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.
Rule of law	Capturing perceptions of the extent to which agents have confidence in and abide by the rules of society and the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.
Control of Corruption	Capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

Sources: World Bank, World Governance Indicators

The choice of these four indices assumes that they serve as a good proxy for regional institutional quality. Furthermore, they have been used in the existing literature as a proxy (Alonso et al, 2013). An extensive discussion of these indices was made in chapter two.

However, most of the institutional quality indices are negative while 3 years are missing. How to deal with the missing data will be discuss in section 5.4.8. The negative characteristics of the data demonstrate that it would be impossible to take their natural logarithm and interpret them in percentage terms. Moreover, transforming the data in the presence of nonstationarity that is useful to test convergence is difficult with negative numbers. Therefore, the institutional quality indices will be rescaled to transform them into positive values.

5.4.7.0 Rescaling and shifting the institutional quality (IQ) indices

There are two ways of altering an existing dataset, namely shifting and rescaling. Shifting involves adding or subtracting the whole data by a constant while rescaling involves dividing or multiplying all the dataset with a constant (Trosset, 2001 and Gentle et al, 2004). A data could also be shifted first and then rescaled by adding the mean to each of the dataset and divide by the standard deviation. Shifting and rescaling could also take a process which involves;

1. Finding the largest and smallest value of each IQ for each country
2. The smallest value is then added to each of the data set
3. The smallest value is then subtracted from the largest
4. The final stage involves dividing process 2 by 3.

Since the IQ dataset ranges between -2.5 and 2.5 and that the average values of ECOWAS IQ are in the negative range, a shift and then rescale will get the data as close to their true values as possible. Shifting and rescaling was tried first although some of the data still contained negative values which makes taking their natural logarithm impossible.

Therefore, this thesis intends to use only shifting by adding 20 to all the IQ dataset. Moreover, Deaton (1997) and Wooldridge (2013) argue that in estimation methods, rescaling or shifting will make little difference to the coefficients since the data is altered by the same constant. Wooldridge (2013) suggested that all the variables used in the regression should be rescaled by the same constant factor. The mean of data that is shifted will change. However, all the measure of spread including the standard deviation and range remain the same since the data has been altered by the same constant. Hence, estimates are unlikely going to be distorted through shifting or rescaling (Deaton, 1997 and Wooldridge, 2013). Therefore, the IQ data is shifted by 20.

5.4.8 Dealing with missing data

So far, we have discussed the variables that are going to be used to estimate our model. Nonetheless, the institutional quality indices and the educational dimension required to compute the HDI got missing years which should be corrected. For example, the institutional quality indices got missing data in 1997, 1999 and 2001. Similarly, the education data are generally collected every two to five years since education policies are not likely to change annually. (World Development Indicators Database). Missing data can arise due to several factors, including nonresponses, incomplete information to compute a composite variable or completely missing (Schafer, 1997). In situations where the data is missing due to incomplete information or nonresponses, ignoring that missing data can bias empirical results (Schafer, 1997; Royston, 2005; Enders, 2010 and Graham, 2012). Therefore, we need to think about dealing with the missing years.

Several procedures have been suggested in the existing literature about how to deal with missing data such as; deletion method, sample mean or mode substitution, interpolation, and extrapolation, using growth rates and multiple imputation (MI) method (Rubin, 1987; Schafer, 1997; Meijering, 2002; Enders, 2010; Graham, 2012; STATA Manual Guide, 2013 and Ghysels and Miller, 2014)). All these procedures are similar since they attempt to predict the missing values from the existing data set which assumes that, the existing data set can indirectly provide us with approximate information about the missing values. Hence, their accuracy could be contested.

Nonetheless, we proposed to use linear interpolation and extrapolation to compute the missing years. This is justified for several reasons. First, education policies do not change annually, while the years of schooling for all ECOWAS members have been consistently increasing since the early 1990s due to their collaboration with the World Bank and UNESCO to meet goal two of the millennium development goals (Harmon, 2001; Cogneau et al, 2010; Dupraz, 2013; MDG Report, 2014 and World Development

Indicators Database). Secondly, Cogneau et al (2010) discovered that the West African integration efforts are stimulating a positive convergence of general welfare including literacy rates. Additionally, expenditure on education as a % of GDP has been gradually increasing in all ECOWAS countries (World Development Indicators Database, 2015). Therefore, the missing education data set is identical with the existing ones given that education policies do not change annually.

By contrast, MI could be more efficient in computing the institutional quality indices since it exhibits certain characteristics such as being a restricted range between -2.5 and 2.5 (Kaufmann et al, 2010). Furthermore, Rubin (1987) and Raghunathan et al (2001) argued that multiple imputations are efficient if the data exhibits restricted range, if large amount of data is missing and if the data is expected to take linear or non-linear shape. However, graphical expression shows that the institutional quality indices for ECOWAS members did not fluctuate severely which suggest that the missing years were unlikely to diverge from the existing dataset. Moreover, only three years were missing. Therefore, we intend to use interpolation and extrapolation since MI is complex and unnecessary when the missing data is small.

5.4.8.0 Interpolating and extrapolation method of filling missing values

Linear interpolation and extrapolation is the process by which missing data $\mathrm{y_n}$ are predicted from two existing data points $\mathrm{y_1}$ *and* $\mathrm{y_2}$

Where;

$$\mathrm{y_1} < \mathrm{y_n} < \mathrm{y_2}$$

Where,

$\mathrm{y_n}$ is the interpolated data (missing value),

$\mathrm{y_1}$ is the first or initial data point,

$\mathrm{y_2}$ is the second data point, Hence, to compute y_n, equation 5.34 is used

$$y_n = y_1 + \left\{(t_n - t_1)\frac{y_2-y_1}{t_2-t_1}\right\} \quad (5.34)$$

Source: Meijering, 2002; Lembcke, 2010 and STATA Manual Guide, 2013

Where;

$t_n =$ is the observed period corresponding to the missing value y_n,

$t_1 =$ is the observed period corresponding to y_1

$t_2 =$ is the observed period corresponding to y_2 *and*

$t =$ in this case is in years

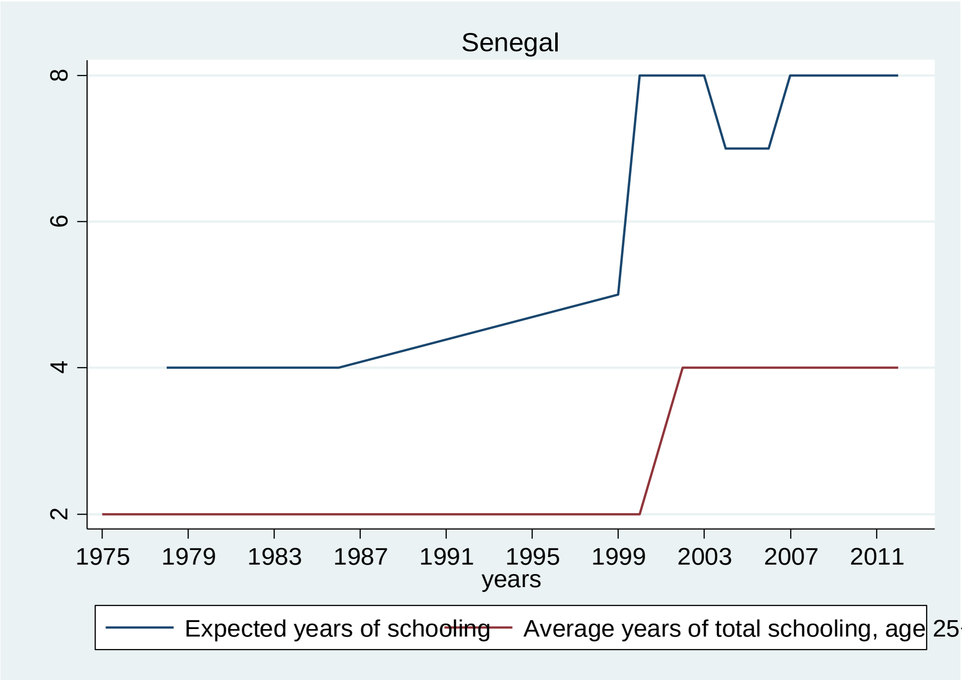
$y =$ is the values to be interpolated and extrapolated.

Equation 5.34 has been used in several papers to fill in the missing values (Meijering, 2002; UNESCO Institute for Statistics; Xiao, 2006 and STATA Manual Guide, 2013). If the computed value on the right-hand side of equation 5.34 is positive, y_n will always be greater than y_1. Equation 5.34 is standard, and it is the method used in STATA and SPSS statistical software to interpolate and extrapolate missing data. Furthermore, the UNDP does use linear interpolation and extrapolation to compute the missing values for all the three dimensions[21] when calculating the HDI (UNDP Technical Notes, 2013).

Figure 5.1 below shows the trend in the expected years of schooling and the average years of schooling in Senegal from 1975 to 2011 which suggest minimal fluctuation in the years for which the data was missing. The education data for other ECOWAS members also exhibit similar trends.

[21] The three dimensions are GDP per capita, life expectancy and education datasets.

Figure 5.1 Senegal education data



Source: World Development Indicators Database: Figure computed from STATA

Interestingly, STATA can interpolate and extrapolate missing values for which data was not available prior by using the two closest data points to compute the previous and future values using equation 5.34 above (Meijering, 2002; Lembcke, 2010 and STATA Manual Guide, 2013). To test the robustness of our interpolated and extrapolated values, a comparison was made by simulation. We omitted some years in the GDP per capita dataset and interpolated and extrapolated them. Thereafter, we used growth rates of GDP per capita to compute the simulated missing values which were then compared. The percentage (%) difference between these values was virtually zero. Therefore, we can argue that the method of filling the missing values in the education and institutional quality indices dataset is justified given the robust approach we took.

Furthermore, a 3-year moving average is used to capture the extent to which the slow pace of change of IQ and the other economic variables could be captured within range of years. The three-year moving average could minimise the bias of the missing data. Delgado et al (2012) used 3-year moving averages to estimate the determinants of national competitiveness in order to test robustness. They found that the 3-year moving average is robust suggesting that microeconomic and economic variables have a short and long-term impact on national competitiveness.

In summary, the HDI, trade, state capacity, regional trade and FDI will be used as independent variables in addition to initial values of IQ and a monetary zone dummy. The language dummy will only be used to see if the results will be identical to the initial IQ. The rescaled IQ will be used as the independent variables. Several tests will be made including autocorrelation and stationarity in order to enable us to test convergence and estimate the determinants of institutional quality. In the next section, the results and analysis will be made.

5.5 Results and Analysis

5.5.0 Introduction

The main theme of this thesis is to examine the quality of institutions in the ECOWAS region in order to inform policy about their deep integration goal. Our discussion in the previous chapters demonstrated that intra-ECOWAS trade is low due to several factors, including high trade costs associated with weakness in the quality of institutions. Moreover, we also demonstrated that the quality of some institutions in the Empirehood and colonial periods in West Africa was more standardized than the current situation in the region. We argued that some facets of regional institutions were abandoned after independence. Therefore, it is useful to examine the conjunction of factors that determine institutional quality today in order to inform policy. Furthermore, testing the process of convergence could further inform policy about the pace of deep integration.

The aim of this section is to present the results and analysis about the process of convergence and determinants of institutional quality using exclusive ECOWAS dataset as a new case study. We will first present summary statistics and simple Pearson correlation of the data set to visualize the nature of the relationship between IQ and Econ. We will then test for autocorrelation and stationarity in the data that enable us to test convergence and estimate determinants of institutional quality using panel fixed or random effect depending on the Hausman test.

5.5.1 Summary statistics

Table 5.5 below shows the summary statistics of the data for ECOWAS countries from 1996 to 2015. The summary is based on the raw data without any transformation. Table 5.5 shows 300 observations (nT) matrix where 'n' is the number of ECOWAS countries (15) and 'T' is the number of years (20) for the dataset. The standard deviation of the overall sample for each variable shows that the within sample variability is smaller than the between sample variability. That is, the variation in each variable across countries (between sample variability) is larger than variation within each country dataset. This implies the unlikelihood of an outlier that could skew estimations towards the outlier. However, the FDI inflows and as percentage of GDP is more variable relative to any of the other variables in the dataset given the large size of their standard deviation. This is largely due to Nigeria and Ghana acting as outliers attracting an estimated US$4.7 billion and US$3.3 billion in 2014 respectively while the third biggest receiver of FDI in the region Cote d' Ivoire received US$438 million (World Investment Report, 2015 and UNCTADSTAT, 2016).

The average HDI is 0.41 which is low relative to other regions of the world. The HDI standard deviation demonstrated that the variation in HDI across countries (between) is equal to the variation of a country overtime (within). Furthermore, intra-ECOWAS trade as a percentage of GDP (regtrade) averaged 6.841%, which suggest that regional trade is not a big component of regional GDP in the last two decades. The standard deviation also demonstrates small variability in regtrade between countries and within a country. As we highlighted in chapter four, ECOWAS aims to increase its trade share to 40% by 2030. Therefore, ECOWAS recognized the poor performance of regional trade flows and the importance of increasing it in order to stimulate their deep integration goal. The small variability in the HDI and regtrade shows that the levels of development and trade of ECOWAS members are identical, hence they face similar development and trade policy challenges. This offers the need for greater cooperation and coordination of their economies. State capacity also shows little variability within a country and between ECOWAS members. Thus, these three variables demonstrate that they could be normally distributed.

Table 5.5 Summary statistics of the nominal data

Variable		Mean	Std. Dev.	Min	Max
	overall	-0.725	0.607	-2.230	0.775
	between		0.580	-1.463	0.493
rule	within		0.231	-1.491	-0.108
	overall	-0.797	0.500	-1.982	0.393
	between		0.478	-1.514	0.123
goveff	within		0.190	-1.265	0.036
	overall	-0.634	0.480	-1.740	0.911
	between		0.425	-1.130	0.402
corrupt	within		0.249	-1.798	0.334
	overall	-0.633	0.438	-2.112	0.132
	between		0.404	-1.481	-0.117
regqual	within		0.198	-1.264	-0.005
	overall	0.412	0.085	0.228	0.648
	between		0.076	0.292	0.578
hdi	within		0.043	0.291	0.495
	overall	13.289	4.234	3.542	25.794
	between		3.668	8.537	21.626
state	within		2.309	4.985	20.920
	overall	5.266	10.002	0.012	85.963
	between		7.670	1.322	32.266
fdig	within		6.705	-26.501	58.964
	overall	512.043	1291.065	0.105	8914
	between		1057.980	11.670	4175
fdit	within		786.546	-2486	5251
	overall	6.831	6.706	0.000	34.538
	between		4.744	0.000	13.522
regtrade	within		4.888	-6.304	28.934
Observation	300				
Countries (n)	15				
Years (T)	20				

Source: Authors Compilation from STATA: See Appendix 5A for the detailed data output.

The mean of the IQ indices is all negative, which demonstrated the extent to which institutions are weak in the region on average. The maximum IQ for corruption is 0.91 in Cape Verde in 2015 while the minimum is -1.74 in Liberia in 1996. The other IQ variables also shows more variability between ECOWAS members than within a country over time given the large size of the between standard deviation relative to the within standard deviation. For regulatory quality (regqual), the maximum is 0.31 in Ghana in 2011 while the minimum is -2.11 in Liberia in 1998. Cape Verde on average acted as the outlier with positive IQ and closer to 1 relative to Liberia which lie in the other extreme with negative numbers and closer to the minimum value of -2.5. Table 5.6 shows the range in the IQ values which suggests extreme values on both end of the tails.

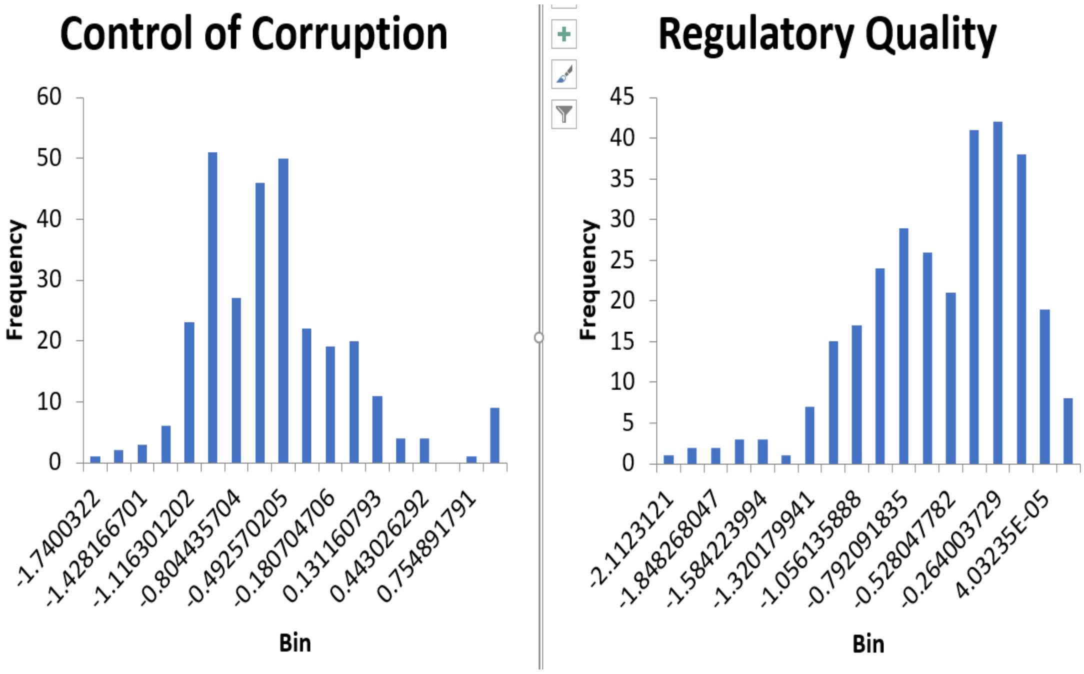
Table 5. 6 Range of Institutional quality indices in West Africa

Indicator	Control of Corruption	Government Effectiveness	Political Stability	Regulatory Quality	Rule of Law	Voice and Accountability
Maximum	0.91	0.39	1.11	0.13	0.77	0.97
Minimum	-1.74	-1.98	-2.5	-2.11	-2.29	-1.83
Country with Maximum	Cape Verde 2015	Cape Verde 1996	Cape Verde 2000	Ghana 2011	Cape Verde 1996	Cape Verde 2011
Country with Minimum	Liberia 1996	Liberia 1998	Liberia 1996	Liberia 1998	Liberia 1996	Niger 1996

Source: Authors computation. Data from World Governance Indicators

Further investigation into the data using histogram depict the distribution of each of the IQ and other indicators. The visual histogram demonstrates that corruption, regulatory quality and rule of law are more normally distributed relative to the other IQ indices although they appear to contain some outliers. Most of the outliers that are skewed to the left are concentrated in Cape Verde while there are no systematic outliers skewed to the left. Nonetheless, the 90th percentile frequency is 9 observations for Cape Verde which is small relative to the overall observation of Cape Verde. Therefore, Cape Verde could be excluded from the regression in order to establish if the results would be identical. Figure 5.2 shows the distribution of two IQ indices. Cape Verde performance in controlling corruption and improving their other institutional quality indices could be largely attributed to their political stability relative to the other countries in ECOWAS.

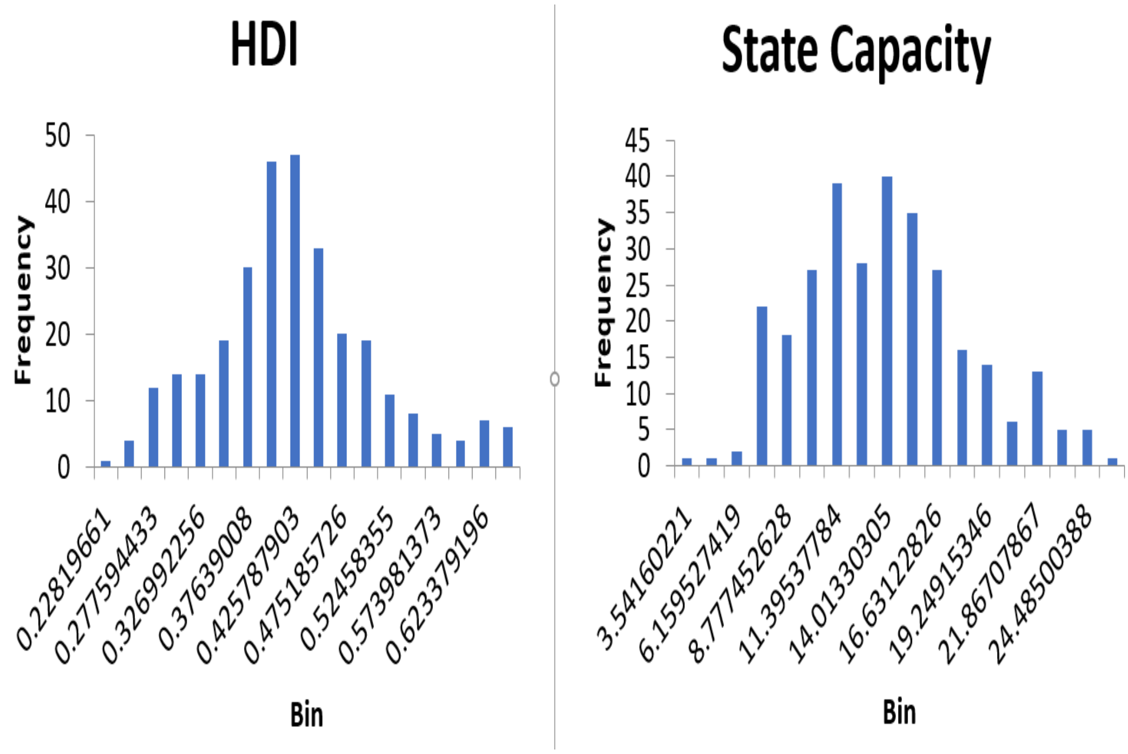
Figure 5. 2 The distribution of the IQ dataset



Source: Authors Depiction. See Appendix 5C for the rest of the figures.

The other variables also demonstrate more normal distribution characteristics except for the FDI (as % of GDP) dataset which is heavily skewed to the left. This was shown in table 5.6 above. Nonetheless, the logarithm of FDI in 1000US$ appear more normally distributed. Figure 5.3 shows the distribution of the HDI and state capacity which suggest some degree of normality.

Figure 5.3: HDI and State Capacity histogram



Source: Authors Depiction. See Appendix 5C1 for more variables

In summary, the descriptive statistics demonstrate that there is more variability between ECOWAS countries than variability of a country over time. This means more fluctuation in some of the dataset over time relative to variability between ECOWAS members. However, the histograms depict that between samples variability is more spread than the summary statistics suggests. Therefore, a further observation of the data using the kutosis and skewness will reveal the extent to which outliers (within sample variability) could pose potential problems in estimation. Kurtosis measures the skewness of a distribution around its mean. A large and greater than 3 kurtosis demonstrates more spread and variability in the dataset. A kurtosis less than three demonstrate that the whole dataset is skewed around its mean hence, outliers pose no issues in statistical inference. Table 5.7 shows the results of the kurtosis test for the dataset.

Table 5.7 Kurtosis test results

Indicator	Kurtosis	Indicators	Kurtosis
Control of Corruption	1.16	HDI	0.35
Government Effectiveness	-0.56	State Capacity	-0.13
Political Stability and Absence of Violence/Terrorism	-0.66	FDI (1000sUS$)	0.56
Regulatory Quality	0.44	Regtrade	1.83
Rule of Law	-0.27		
Voice and Accountability	-0.73		

Source: Authors Depiction. See Appendix 5D and 5D1 for more detail

Clearly, Table 5.7 shows that the kurtosis are less than three for all the variables which demonstrate that the dataset is skewed around its mean. Hence, within sample variability or outliers are unlikely to pose bias in the estimation. Hence, the normality of the dataset in general means we could now test autocorrelation, stationarity, convergence and the determinants of institutional quality using panel data. This will be done in the next sections.

5.5.2 Correlation Test

Correlation measures the direction and strength of association between two variables rather than causality which is associated with regression. It is a good starting point to look at the degree of association between variables before establishing the direction of causality. While it is argued that correlation should be used when the nature of relationship is expected to be linear, normally distributed and continuous, it can still be useful in gauging some degree of relationship although our institutional quality indices are not continuous. In section 5.5.1, it was demonstrated that the data was normally distributed. Table 5.8 shows the correlation matrix derived from excel for the entire dataset. The correlation shows a mixed pattern of both positive and negative correlation as well as no correlation.

The institutional quality indices demonstrate positive correlation between them. This is useful because it enables us to decide whether to use all the IQ indices. The correlation between corruption and rule of law is 0.814 (0.814^2), which means 66% of the variation of corruption is related to rule of law. Similarly, the correlation between regulatory quality and rule of law is 0.830 (0.830^2), which means 69% of the variation of regulatory quality is related to rule of law. Corruption and political stability is 0.612 (0.612^2), which means 37% of the variation of corruption is related to political stability. Government effectiveness demonstrate high correlation with the other IQ variables. Therefore, in consolidation to the summary statistics in section 5.5.1, we will use the five IQ variables in the autocorrelation, convergence and regression.

Table 5. 8: Correlation of regulatory quality with the independent variables

	hdi	*state*	*fdig*	*fditt*	*regtrade*	*corrupt*	*goveff*	*political*	*regqual*	*rule*	*voice*
hdi	1										
state	0.091458	1									
estate	0.287705	-0.15132									
fdig	0.073551	-0.04474	1								
fdit	0.352195	-0.15888	0.025627								
fditt	0.352195	-0.15888	0.025627	1							
regtrade	-0.06969	-0.03499	-0.15517	-0.15328	1						
exports	0.292943	-0.1413	-0.11669	0.730306	0.094977						
imports	0.063856	0.133269	-0.15184	0.118474	0.519338						
ecowas	0.248965	-0.05482	-0.14945	0.604472	0.279072						
corrupt	0.4027	0.514557	-0.09566	-0.12892	-0.24723	1					
goveff	0.432431	0.425371	-0.22613	-0.02298	-0.23264	0.799518	1				
political	0.242357	0.448011	-0.11887	-0.31698	0.014984	0.611569	0.637665	1			
regqual	0.31112	0.47748	-0.32469	0.013892	-0.04341	0.754245	0.832758	0.654935	1		
rule	0.416843	0.487068	-0.14697	-0.09015	-0.11712	0.814089	0.870375	0.790797	0.830083	1	
voice	0.453957	0.536087	-0.01057	-0.00282	-0.1415	0.692123	0.735539	0.637208	0.623881	0.766212	1

Note: Authors Depiction from excel output

The correlation between the HDI and state capacity and the institutional quality indices are positive and low. For example, only 16% of variation in HDI is related to corruption while state capacity with corruption is 27% variation. State capacity and regulatory quality is related by 23% while regulatory quality is related with HDI by 10%. Raiser et al (2001) found that a 10% increase in state capacity lead to 0.02% increase in institutional quality in Eastern Europe and the Balkans. This is consistent with existing research findings that as incomes and development improves, citizens will demand better institutions from their governments (Straub, 2000; Moss, 2006; Berggren et al, 2013 and Alonso et al, 2013).

In contrast, the correlation between regional trade as % of GDP (regtrade) and FDI with the institutional quality indices is weak and sometimes no correlation. For example, the correlation between regtrade and political stability is positive but with 0% relationship. The other IQ variables show inverse relationship with regtrade and insignificant.

In summary, the correlation matrix demonstrates that variation in the institutional quality indices are related to HDI and state capacity while FDI and regtrade seem to offer no statistically significant association with the institutional quality indices. This will be investigated further through estimation. Before that, we test for autocorrelation and stationarity.

5.5.3 Testing Autocorrelation in panel data

Autocorrelation exists when the independent variables are correlated with the error term. This was discussed in section 5.3. The presence of autocorrelation in panel data unbias the estimates. However, the standard errors get smaller with high R-square which makes statistical inference inefficient because the variances become large (Drukker, 2003; Reyna, 2007 and Wooldridge, 2013). Furthermore, convergence test is conditional on no autocorrelation data. Hence, we need to test it before any estimation. The test involves obtaining residuals from a first difference regression. The residuals are then regressed against the independent variables (Pasaran, 2004 and Wooldridge, 2013). The Wooldridge panel autocorrelation test has been widely used in the literature because it is assumed less restrictive and it is also robust (Drukker, 2003 and Reyna, 2007). The statistical significance of the coefficients is tested under the null;

H0=no first-order autocorrelation

Ha=first-order autocorrelation

By computation if;

$$\mathrm{IQ}_{i,t} = \beta_0 + \beta_1 \mathrm{Econ}_{ki,t} + \beta_2 \mathrm{IQ}_{i0} + \beta_3 \mathrm{IQ}_{j,t} + \beta_4 \mathrm{W}_{ki,t} + \varepsilon_{i,t} \tag{5.35}$$

$$\mathrm{IQ}_{i,t} - \mathrm{IQ}_{i,t-1} = \beta_1 \mathrm{Econ}_{ki,t} - \mathrm{Econ}_{ki,t-1} + \beta_2 \mathrm{IQ}_{j,t} - \mathrm{IQ}_{j,t-1} + \varepsilon_{i,t} - \varepsilon_{i,t-1} \tag{5.36}$$

$$\Delta\mathrm{IQ}_{i,t} = \beta_1 \Delta\mathrm{Econ}_{ki,t} + \beta_2 \Delta\mathrm{IQ}_{j,t} + \Delta\varepsilon_{i,t} \tag{5.37}$$

Hence, any time invariant variable such as language and belonging to WAMZ or WAEMU are removed once the first difference is performed. Once the residuals are obtained from 5.37, we then specify the Wooldridge test for autocorrelation in panel data using equation 5.38 below;

$$\mathrm{e} = \beta_2 \mathrm{Econ}_{ki,t} + \beta_2 \mathrm{IQ}_{i0} + \beta_3 \mathrm{IQ}_{j,t} + \beta_4 \mathrm{W}_{ki,t} \tag{5.38}$$

Failing to reject the null hypothesis implies that the data does not suffer from autocorrelation. We could then proceed in testing panel stationarity. Pasaran test for correlation also tests whether the residuals are correlated across countries (entities) using similar method to the Wooldridge test (Pasaran, 2004). It should be noted that differencing panel data require care. In STATA, setting the data as a panel would differentiate the data for each of the units without cross over to another country.

The results from autocorrelation allows us to take two approaches to estimate panel data. STATA has robust commands that correct autocorrelation and heteroskedasticity once it is found. The other option is to correct it first before estimation.

Nonetheless, autocorrelation cannot be removed entirely in research related to the determinants of institutional quality. Easterly and Levine (2003) and Diebold (2007) highlight that all we do in regressions is to identify how useful some variables are in explaining institutional quality rather than establish causality.

Several tests were conducted, and the data suggest autocorrelation in the panel data in the nominal and log form. Appendix 5F and 5G provides the Wooldridge test. We then used generalised least square to predict the residuals and used Wooldridge autocorrelation test on the residuals using equation 5.38. These results are presented in Table 5.9 below.

Table 5.9 Wooldridge test for first-order autocorrelation in panel data

Variable	F-statistics	P-Value
Regulatory Quality	0.373	0.552
Control of Corruption	0.058	0.813
Rule of Law	0.480	0.501
Political Stability	0.226	0.642
Voice and Accountability	0.050	0.823

Source: Authors Compilation from STATA. See Appendix 5G

Using generalised least square (GLS) or feasible generalised least square (FGLS) correct autocorrelation and heteroskedasticity in panel data (Baltagi, 2005). We follow equation 5.35 to 5.38 using Xtregar command in STATA to check autocorrelation in the residuals (Baltagi, 2005 and Wooldridge, 2013). The results in Table 5.9 suggest no autocorrelation in the residuals. Therefore, we can proceed to test stationarity and convergence in the next section and then measure determinants of institutional quality.

5.5.4 Testing stationarity and convergence

As we highlighted earlier, convergence test requires the data to be stationary. A data is said to be stationary if the mean, variance, and autocorrelation do not vary over time (Burke, 2011 and Wooldridge, 2013).

With these qualifications, stationary data satisfy many of the Classical Linear Regression Model (CLRM) assumptions about the behavior of a dataset. Therefore, estimating a stationary data imply that we could directly attribute variation in the dependent variable to variation in the independent variables. Stationarity test is mainly associated with time series data.

Nonetheless, models have been developed to test stationarity in panel data such as; Levin–Lin–Chu (LLC), Harris–Tzavalis (HT), Breitung, Im–Pesaran–Shin (IPS), and Fisher-type tests (Baltagi, 2005 and STATA Manual Guide 13, 2013). These tests have as their null hypothesis that all the panels contain a Unit root (nonstationary). Hence, rejecting the null imply the presence of stationary data (Quah, 1993; Islam, 1995; Ben-David, 1996; Levin et al, 2002 and Baltagi, 2005). The null in the Hadri -Lagrange multiplier (LM) test is that all the panels are trend stationary. Banerjee et al (2005) argued that the panel unit root test may reject the null when the time series aspects are nonstationary. Hence, a unit root test for each country (cross section) should be performed and then the panel data test to see if the results will be identical. Furthermore, panel Unit root test (stationarity) has been criticized for assuming cross-sectional independence (Baltagi, 2005). Hence, a Unit root tests in the panel data and for each country will be performed to see if results are identical. The basic model for the panel unit root test is given in equation 5.39;

$$\Delta \mathrm{IQ}_{\mathrm{it}} = \emptyset_{\mathrm{i}} \, \mathrm{IQ}_{\mathrm{i,t-p}} + \mathrm{Z}'_{\mathrm{it}} \, \gamma_{\mathrm{i}} + \mu_{\mathrm{it}} \qquad (5.39)$$

Where;

$\mathrm{IQ} = \text{institutional quality or another variable,}$

$\mathrm{i} = 1 \text{ country,}$

$\mathrm{t} = 1, \ldots, \mathrm{n} \text{ number of years,}$

$\mathrm{p} = \text{number of lags}$

$Z'_{it} \, \gamma_i = \text{panel specific means which are assumed to equal 1 and 1t with the trend}$

The null in equation 5.39 is $\mathrm{H0}: \emptyset_{\mathrm{i}} = 0$ for all i against the alternative that $\mathrm{Ha}: \emptyset_{\mathrm{i}} < 0$ for some or all i. Rejecting the null implies the presence of stationarity. The key to equation 5.39 is the degree to which past values of a series contain useful information explaining its current behavior. If the coefficient gets smaller, it implies that its current value does not depend on time. Hence, the difference between the current values and their lags is temporary.

The panel stationarity test requires that the data is strongly balanced. Therefore, the time span used to compute the unit root test is from 1996 to 2015. As highlighted earlier, the small-time span means that the unit root test may not have strong estimation power. We use ECOWAS averages as a base which is the default for the unit root test in STATA (using the average of the sample as a base). Since the existing literature is inconclusive as to which test is the most appropriate, we utilise all the six tests.

In general, the findings support the view that the quality of institutions is stationary and converging over time with and without cross section dependence in the Levin–Lin–Chu (LLC) and Harris–Tzavalis (HT) test. The other tests also suggest element of stationarity in the dataset except for the Hadri -Lagrange multiplier (LM) that suggest the data is nonstationarity. On the balance that the majority of the test suggest stationarity demonstrate consistency. We also performed unitroot test for each country. The results were much mixed relative to the panel results. Nonetheless, the LLC demonstrates stationarity for the majority of the countries while the other test demonstrates stationarity for selected number of countries. This is expected since, in recent years, ECOWAS has been building joint border posts to improve the regulation of cross-border trading and to reduce trade costs brought about by weakness in the quality of institutions. Furthermore, the coming into force of the ECOWAS CET in 2015 implies the adoption of common trade policies. Although it is too early to evaluate the effectiveness of the ECOWAS CET, its launch has the potential to reduce incentives to collect bribes by customs officials given the commonality of trade policies. Table 5.10 shows the results of the unitroot test.

Table 5.10 Unitroot test of selected institutional quality indices

Type of Tests	Variable	normal	Demean	Demean/trend	Trend	Lags	Trend/ lags	Trend/demean/lags
Levin-Lin-Chu	regulatory	-3.390 (0.000)	-2.799 (0.003)	-2.267 (0.011)	-1.675 (0.046)	-4.166 (0.000)	4.834 (1.000)	-2.833 (0.002)
	corruption	-2.807 (0.002)	-2.918 (0.001)	-1.463 (0.071)	-1.902 (0.028)	-3.520 (0.000)	2.688 (0.996)	-2.095 (0.018)
	rule of law	-2.909 (0.001)	-2.873 (0.002)	-2.103 (0.017)	-2.218 (0.013)	-2.735 (0.003)	1.263 (0.896)	-2.323 (0.010)
Harris–Tzavalis (HT	regulatory	-1.380 (0.083)	-1.238 (0.107)	-0.733 (0.231)	-0.298 (0.382)			
	corruption	-1.661 (0.048)	-1.529 (0.063)	1.321 (0.906)	1.128 (0.870)			
	rule of law	0.094 (0.537)	0.217 (0.583)	2.199 (0.986)	1.892 (0.970)			
Im–Pesaran–Shin (IPS	regulatory	-2.282 (0.011)	-2.325 (0.010)	-2.296 (0.010)	-1.642 (0.050)	-1.433 (0.075)	0.556 (0.711)	2.068 (0.980)
	corruption	-2.148 (0.015)	-1.923 (0.027)	-1.542 (0.061)	-1.771 (0.038)	-0.152 (0.439)	0.901 (0.816)	1.188 (0.882)
	rule of law	-0.328 (0.371)	-0.395 (0.346)	-0.531 (0.297)	-0.823 (0.205)	-1.247 (0.106)	0.917 (0.820)	0.310 (0.621)
Fisher	regulatory					3.610 (0.000)	7.244 (0.000)	2.334 (0.009)
	corruption					1.076 (0.140)	2.074 (0.019)	-0.143 (0.557)
	rule of law					1.056 (0.145)	-2.106 (0.982)	-0.301 (0.618)

Note: This test is based on the log of institutional quality indices. The figures in brackets are the corresponding p-values. See Appendix 5H for the detailed data.

The key findings from these tests show that the data is stationary for most of the test in the panel and for some individual countries. This allows us to test convergence and other estimates. Nonetheless, the stationary test which also implied convergence does not depict how long it could take ECOWAS to attain full convergence of their institutions (Quah, 1993; Islam, 1995; Ben-David, 1996; Levin et al, 2002 and voltage, 2005). This is more useful from a policy point of view rather than just stating that institutional quality exhibit convergence. Hence, we adopt Ben-David simple convergence equation which is restated blow in 5.40.

$$(\mathrm{IQ}_{\mathrm{i,t}} - \overline{\mathrm{IQ}}_{\mathrm{i,t}}) = \emptyset\,(\mathrm{IQ}_{\mathrm{i,t-1}} - \overline{\mathrm{IQ}}_{\mathrm{i,t-1}}) + \varepsilon_{\mathrm{i,t}} \qquad (5.40)$$

The half-life convergence rate adopted by Ben-David (1996) is given by;

$$\text{Half life convergence} = \frac{\ln(0.5)}{\ln(\emptyset)} \qquad (5.41)$$

It measures the number of years (half-life) it takes before the differences in IQ are halved. We highlighted in section 5.3 that using OLS could give efficient estimates if the data is stationary (Sims, 1980; Gujarati and Porter, 2009 and Wooldridge, 2013). Therefore, we performed the Hausman test in order to decide whether to use fixed or random effect in panel data and Breusch and Pagan Lagrangian multiplier test for random effects. The Hausman test involved running a regression for the fixed effect and stores the predicted values and then run another regression using random effect and store it. Then a Hausman test is performed with the null that the unique errors are uncorrelated with the regressors (Reyna, 2007). Rejecting the null implies the use of fixed effect. In the Breusch and Pagan test, the null hypothesis is that the variances across entities is zero or more specifically that there is no significant difference across units (no panel effect). The results in the Hausman test suggest the use of fixed effect while Breusch and Pagan suggest random effect. The fixed effect results only marginally reduced the coefficients rather than change the statistical significance of the results. For example, the regulatory quality coefficient of the random effect is 0.946 and that of the fixed effect is 0.804. The same applies to the other institutional quality indices. Similarly, the fixed effect regression omits the dummy variables which is relevant in understanding the extent to which they influence institutional quality. Therefore, we use the random effect.

Table 5.11 shows the results from a random effect (RE) and feasible generalized least squares (FGLS) methods. Table 5.12 presents the three-year moving average results. The FGLS is used to correct heteroscedasticity.

Given the divergent path of integration between WAMZ and WAEMU that was discussed in chapter three, we also estimated the half-life convergence by sub-regional groupings. This could provide useful policy implication on how ECOWAS could manage deep integration in the presence of overlapping sub-regional groupings.

Table 5.11 Random effect and FGLS convergence test in panel data

Estimation	RE				FGLS				Half-Life			
variable	regqual	corrupt	rule	political	regqual	corrupt	rule	political	regqual	corrupt	rule	political
ECOWAS	0.946 (0.000)	0.947 (0.000)	0.954 (0.000)	0.937 (0.000)	0.946 (0.000)	0.946 (0.000)	0.954 (0.000)	0.937 (0.000)	12	13	15	11
WAEMU	0.953 (0.000)	0.905 (0.000)	0.945 (0.000)	0.909 (0.000)	0.953 (0.000)	0.905 (0.000)	0.945 (0.000)	0.909 (0.000)	14	7	12	7
WAMZ	0.949 (0.000)	0.944 (0.000)	0.956 (0.000)	0.952 (0.000)	0.949 (0.000)	0.986 (0.000)	0.958 (0.000)	0.954 (0.000)	13	12	15	14

Note: p-values in parentheses. WAMZ includes the 6 English speaking countries plus Guinea Conakry. WAEMU includes the 8 French-speaking countries plus Guinea-Bissau. Cape Verde is not part of WAMZ or WAEMU but part of ECOWAS. FGLS is feasible generalized least squares. See Appendix 5K

Table 5.12 Random effect and FGLS convergence test in panel data; 3 year moving average results

Estimation	RE				FGLS				Half-Life			
variable	regqual	corrupt	rule	political	regqual	corrupt	rule	political	regqual	corrupt	rule	political
ECOWAS	0.949 (0.000)	0.949 (0.000)	0.957 (0.000)	0.949 (0.000)	0.964 (0.000)	0.993 (0.000)	0.965 (0.000)	0.966 (0.000)	13	13	15	13
WAEMU	0.817 (0.000)	0.954 (0.000)	0.951 (0.000)	0.944 (0.000)	0.924 (0.000)	0.962 (0.000)	0.954 (0.000)	0.959 (0.000)	4	15	14	12
WAMZ	0.952 (0.000)	0.918 (0.000)	0.954 (0.000)	0.939 (0.000)	0.961 (0.000)	0.956 (0.000)	0.963 (0.000)	0.969 (0.000)	14	8	15	11

Note: p-values in parentheses. WAMZ includes the 6 English speaking countries plus Guinea Conakry. WAEMU includes the 8 French-speaking countries plus Guinea-Bissau. Cape Verde is not part of WAMZ or WAEMU but part of ECOWAS. FGLS is feasible generalized least squares. See Appendix 5K

The results in Table 5.11 and Table 5.12 are based on the logarithm of the institutional quality indices. The key observation in both tables signify the importance of cooperation within ECOWAS as a prerequisite to accelerate integration rather than pursuing separate integration with the current monetary zones. Indeed, the half-life convergence for ECOWAS is smaller on average than the half-life convergence of WAMZ. Expectedly, WAEMU which has been a customs union with a single currency and central bank demonstrate lower half-life convergence than WAMZ and ECOWAS. Indeed, the half-life convergence within the sub-groupings in ECOWAS suggests a divergent path which raises the issue of whether it would be possible in the medium term to achieve full convergence of institutions without streamlining some of them. For example, the half-life convergence of the regulatory quality for WAMZ members is 13 years while rule of law is 15 years. That of ECOWAS and WAEMU is moderately lower that WAMZ. Jones (2002) and Shams (2003) found that ECOWAS exhibit convergence of price and income, although the process is slow which supports our findings in the context of institutions. This process could be made slow if the multiple sub-regional groupings pursuing similar aims with divergent path is minimised.

Interestingly, ECOWAS's vision 2020 aims to remove all barriers to cross-border trade as well as to launch the single currency (ECO) and to harmonise other institutional framework. Furthermore, the ongoing construction of joint border posts and increased sensitization of traders could facilitate the standardization of institutions and may have contribute to a faster integration (Ojide, 2010). These figures suggest that the presence of sub-groupings in ECOWAS is slowing the integration process although they could eventually merge. Furthermore, these results are consistent with trade theories and with previous findings that trading partners could exhibit the convergence of income and prices (Ben-David, 1996 and Zhang, 2006). Further studies also found that institutional quality difference between trading partners does reduce trade flows (Helble et al, 2012 and Lejarraga and Shepherd, 2013).

Therefore, full convergence of institutions requires greater cooperation between WAMZ and WAEMU. However, given the differences in the rate of convergence among the sub-groupings, WAMZ and WAEMU could work together in tandem within ECOWAS to accelerate the convergence process rather that the separate monetary zones. The novelty would be that WAMZ streamline its activities to pursue an ECOWAS wide integration process by adopting the successes within WAEMU given the lower convergence rate within WAEMU. Therefore, some of the WAMZ countries which might benefit from adopting institutions from WAEMU such as the CFA could adopt it. However, this will probably require political decisions as well as WAEMU departing from using the French treasury to deposit part of their external reserves (Diop, 2014; Sene, 2014 and Koulibaly, 2014). Indeed, one of the contending issues about ECOWAS monetary integration lies in the extent to which WAEMU and WAMZ cooperate. Figures vary, but the AfricanGlobe (2012) found that 14 French colonies in SSA (8 of which are part of WAEMU) deposited an estimated US$400bn to the French Treasury since independence. It is unlikely that WAMZ members would accept this initiative. Therefore, although the ECOWAS vision 2020 aims to achieve convergence of its regional institutions and to introduce a single currency, there are underlying issues which they should resolve first including accelerating the convergence of regional institutions. Greater cooperation within the framework of ECOWAS or WAMZ gradually adopting WAEMU successes is the novelty rather than the separate momentary zones that seem to have similar aims with divergent path that slows the convergence and deep integration process.

In the next section, we complement the convergence process by estimating the conjunction of factors that determine institutional quality in the ECOWAS region.

5.5.5 Determinants of institutional quality

In the previous section, we tested convergence of institutions within ECOWAS and found support for the convergence nexus although at a slow pace. Furthermore, the findings demonstrate that the rate of convergence could be accelerated if WAMZ and WAEMU work together within the ECOWAS framework or improve cooperation.

The aim of this section is to go a step further and complement section 5.5.4 by estimating the conjunction of factors that determine the quality of institutions in the region. The model we specified demonstrate that the quality of institutions is a function of economic indicators, past institutional quality, the quality of institutions of other ECOWAS members and belonging to a monetary zone (Straub, 2000; Borner et al, 2004; Kandil, 2009 and Alonso et al, 2013). We use initial values instead of lagged institutional quality to minimise endogeneity (Wooldridge, 2013 and Koenker, 2014). Panel data is used for the 15 ECOWAS countries from 1996 to 2015 and a random effect to run the regression and FGLS to correct heteroskedasticity. We also used a three-year moving average in order to test robustness of the results.

The results are presented in Table 5.13 and Table 5.14 below. Table 5.14 are the three-year moving average results. The results show strong support for initial values, the level of development and state capacity as important determinants of institutional quality in ECOWAS. Furthermore, the results also demonstrate that the presence of WAMZ and WAEMU in part negatively impact on the quality of institutions in the region. Regional trade does impact on institutional quality, but the relationship is mixed depending on the type of institution. We look at each of these results in more detail below.

The initial value of all the institutional quality (log initial IQ) indices demonstrate that past IQ contain useful information in explaining current institutions. Nonetheless, percentage improvement in past IQ leads to less than one percentage improvement in current institutions. These findings are consistent with previous findings that past IQ and colonial history contain memory in explaining current institutions (Acemoglu et al, 2001; Rodrik, 2007 and Nunn, 2008). Acemoglu et al (2001) argued that about 50% of the variation in current institutions of former colonies could be explained by past institutions. These findings have some implication because it demonstrates that institutions are sticky and takes time to improve. Therefore, ECOWAS ability to improve their institutions in the future could in part depend on the extent to which they make efforts to improve them now.

We also estimated the extent to which the IQ for the rest of ECOWAS members impact on individual countries IQ (Log IQ Ecowas (V-i)). The findings demonstrate that there is a pull factor and learning practices from each other when it comes to regulatory quality and voice and accountability. That is, regulatory quality and voice and accountability of the rest of ECOWAS positively impact on domestic regulatory quality and voice and accountability. This may not be surprising because ECOWAS members have moved away from the non-interference in a sovereign nation slogan in SSA by holding each other accountable in the quest for democratisation, regional peace and security. ECOWAS recognised the importance of stability in the development process while the region has been recording positive amount of growth in the last decade.

Furthermore, the level of development (lhdi), state capacity (lstate) and FDI (lfdig) also demonstrate positive and statistically significant relationship with the quality of institutions in the region. For example, 10-percentage improvement in the HDI leads to 0.9% and 1.3% improvement in regulatory quality and voice and accountability respectively. This is consistent with previous findings that development improves institutional quality (La Porta, 1999; Straub, 2000; Rijckeghem et al, 2001; Islam et al, 2002; Acemoglu et al, 2005; Mocan, 2008; Levechenko, 2012 and Alonso et al, 2013). Therefore, pursuing a regional development initiative is likely to generate fruitful results for the region's integration than separate development initiatives by individual member states. A 10-percentage increase in state capacity leads to 0.15% and 0.11% improvement in the rule of law and political stability respectively. Raiser et al (2001) also found that 10%

improvement in state capacity leads to 0.02% improvement in institutional quality in Eastern Europe and the Balkans. These findings have some implications for ECOWAS. First, the impact of these variables is limited and that huge improvement in HDI, state capacity and FDI would be needed in order to promote region wide initiative to standardise their institutions. Indeed, our discussion in section 5.3.2 demonstrate that demand for better institutions hinge on the extent to which there is greater interaction between agents. Therefore, sharing development initiatives could generate demand for better regional institutions.

Similarly, regional trade expansion should stimulate demand for better institutions and their standardisation in the region. Some papers have found that openness contains useful information in explaining the quality of institutions (Straub, 2000; Koremonos, 2001; Rosendorff and Milner, 2001; Islam and Montenegro, 2002, Shams, 2003; Stefanadis, 2010 and Shepherd and Lejarraga, 2013). However, our findings show that regional trade as percentage of GDP (lregtrade) positively influence regulatory quality and rule of law but not the other institutional quality indices. That is, 10% improvement in lregtrade leads to 0.025% and 0.02% improvement in regulatory quality and rule of law respectively.

Table 5.13 Determinants of institutional quality

Estimation	Regulatory quality		Corruption		Rule of Law		Political Stability		Voice and Accountability	
Variable	RE	FGLS	RE	FGLS	RE	FGLS	RE	FGLS	RE	FGLS
Log Initial IQ	0.339 (0.000)	0.339 (0.000)	0.316 (0.000)	0.316 (0.000)	0.361 (0.000)	0.361 (0.000)	0.222 (0.000)	0.222 (0.000)	0.423 (0.000)	0.423 (0.000)
Log IQ Ecowas (V-i)	0.160 (0.355)	0.160 (0.346)	-1.564 (0.000)	-1.564 (0.000)	-0.986 (0.000)	-0.986 (0.000)	-4.780 (0.000)	-4.780 (0.000)	0.725 (0.000)	0.725 (0.000)
lhdi	0.090 (0.000)	0.090 (0.000)	0.184 (0.000)	0.184 (0.000)	0.063 (0.011)	0.063 (0.010)	0.002 (0.978)	0.002 (0.978)	0.138 (0.000)	0.138 (0.000)
lstate	0.004 (0.066)	0.004 (0.061)	0.081 (0.000)	0.081 (0.000)	0.015 (0.000)	0.015 (0.000)	0.011 (0.000)	0.011 (0.099)	0.002 (0.722)	0.002 (0.717)
lfdig	0.003 (0.000)	0.003 (0.000)	0.002 (0.005)	0.002 (0.004)	0.001 (0.008)	0.001 (0.007)	0.003 (0.081)	0.003 (0.076)	0.002 (0.023)	0.002 (0.021)
sqlhdi	0.056 (0.000)	0.056 (0.000)	0.098 (0.000)	0.098 (0.000)	0.034 (0.008)	0.034 (0.007)	0.014 (0.657)	0.014 (0.651)	0.081 (0.000)	0.081 (0.000)
lgoveff	0.545 (0.000)	0.545 (0.000)	0.442 (0.000)	0.442 (0.000)	0.476 (0.000)	0.476 (0.000)	0.452 (0.000)	0.452 (0.000)	0.634 (0.000)	0.634 (0.000)
lregtrade	0.0025 (0.000)	0.0025 (0.000)	-0.002 (0.000)	-0.002 (0.000)	0.002 (0.000)	0.002 (0.000)	0.001 (0.425)	0.001 (0.417)	-0.000 (0.423)	-0.000 (0.415)
Zone	-0.004 (0.056)	-0.004 (0.052)	-0.002 (0.143)	-0.002 (0.136)	-0.004 (0.035)	-0.004 (0.031)	-0.004 (0.469)	-0.004 (0.461)	0.004 (0.204)	0.004 (0.196)
Wald Chi square	934.40 (0.000)	969.00 (0.000)	1132.32 (0.000)	1180.70 (0.000)	1745.20 (0.000)	1809.84 (0.000)	453.18 (0.000)	469.96 (0.000)	804.56 (0.000)	834.36 (0.000)
Observation	280	280	280	280	280	280	280	280	280	280

Source: Author Calculation from STATA: Note:log initial IQ is the initial value of IQ; log IQ Ecowas (V-i) rest of ECOWAS IQ; lhdi- HDI for each member; lstate- state capacity for each member; lfdig- FDI for each member; lregtrade- intra-ECOWAS trade as % of GDP for each member; Zone- belong to WAMZ=0 and WAEMU=1; lhdiecow- log of hdi multiplied by total intra-ECOWAS trade; hdiecow- hdi multiplied by ecowas trade.

Table 5.14 Determinants of institutional quality; 3 year moving average results

Estimation	Regulatory quality		Corruption		Rule of Law		Political Stability		Voice and Accountability	
Variable	RE	FGLS	RE	FGLS	RE	FGLS	RE	FGLS	RE	FGLS
Log Initial IQ	0.374 (0.000)	0.374 (0.000)	0.*341* *(0.000*)	0.341 (0.000)	0.298 (0.000)	0.298 (0.000)	0.103 (0.031)	0.103 (0.027)	0.386 (0.000)	0.465 (0.000)
Log IQ Ecowas (V-i)	0.041 (0.808)	0.041 (0.804)	-3.057 (0.000)	-5.057 (0.000)	-2.646 (0.000)	-2.646 (0.000)	-6.366 (0.000)	-6.366 (0.000)	0.827 (0.000)	0.492 (0.047)
lhdi	0.092 (0.000)	0.092 (0.000)	0.133 (0.000)	0.133 (0.000)	0.083 (0.000)	0.083 (0.000)	-0.014 (0.804)	-0.014 (0.800)	0.066 (0.054)	0.162 (0.000)
lstate	0.009 (0.001)	0.009 (0.001)	0.063 (0.027)	0.063 (0.024)	0.013 (0.000)	0.014 (0.000)	0.069 (0.367)	0.069 (0.356)	0.002 (0.669)	0.001 (0.891)
lfdig	0.003 (0.000)	0.003 (0.000)	0.003 (0.000)	0.003 (0.000)	0.004 (0.000)	0.004 (0.000)	0.004 (0.036)	0.004 (0.032)	0.003 (0.008)	0.004 (0.001)
sqlhdi	0.055 (0.000)	0.055 (0.000)	0.073 (0.000)	0.073 (0.000)	0.040 (0.001)	0.040 (0.001)	0.008 (0.784)	0.008 (0.779)	0.042 (0.016)	0.096 (0.000)
lgoveff	0.501 (0.000)	0.501 (0.000)	0.367 (0.000)	0.367 (0.000)	0.417 (0.000)	0.413 (0.000)	0.526 (0.000)	0.526 (0.000)	0.746 (0.000)	0.547 (0.000)
lregtrade	0.002 (0.000)	0.002 (0.000)	-0.002 (0.000)	-0.002 (0.000)	0.002 (0.000)	0.002 (0.000)	0.0007 (0.565)	0.0007 (0.556)	-0.000 (0.947)	0.000 (0.620)
Zone	-0.003 (0.011)	-0.003 (0.009)	0.003 (0.042)	0.003 (0.037)	-0.000 (0.745)	-0.000 (0.691)	0.009 (0.016)	0.009 (0.014)	0.001 (0.644)	-0.002 (0.332)
Wald Chi square	1286.20 (0.000)	1339.56 (0.000)	1579.89 (0.000)	1648.12 (0.000)	2111.95 (0.000)	2256.81 (0.000)	550.90 (0.000)	576.15 (0.000)	430.42 (0.000	848.61 (0.000)
Observation	251	251	251	251	251	251	251	251	251	251

Source: Author Calculation from STATA: Note:log initial IQ is the initial value of IQ; log IQ Ecowas (V-i) rest of ECOWAS IQ; lhdi- HDI for each member; lstate- state capacity for each member; lfdig-FDI for each member; lregtrade- intra-ECOWAS trade as % of GDP for each member; Zone- belong to WAMZ=0 and WAEMU=1; lhdiecow- log of hdi multiplied by total intra-ECOWAS trade; hdiecow-hdi multiplied by ecowas trade.

Our discussion in the previous chapters demonstrate that ECOWAS cross border trade cost about US$100 per trip in bribes despite all the protocols being signed on free movement of goods and people. This point to weak regulatory quality and lack of adherence to the rule of law. Moreover, we demonstrate that ECOWAS traders are not sensitised about their rights. Therefore, regional trade must increase to a level that stimulate demand to improve the quality of institutions in the region given the trade costs associated with weak institutions.

Interesting belonging to WAMZ or WAEMU (zone[22]) generated mixed results. The zone coefficients show negative for all the IQ except voice and accountability in Table 5.13 while Table 5.14 shows that regulatory quality, rule of law and FGLS in voice and accountability are negative. The positive coefficients confirm our convergence results that WAEMU is more integrated that WAMZ in the ECOWAS region. That is, the negative coefficients demonstrate that WAMZ quality of institutions is lower compared with WAEMU. Therefore, WAMZ members could learn best practices from WAEMU. Moreover, WAMZ could streamline its operations and adopt an ECOWAS wide standardisation process than to emulate WAEMU in order to prepare for an ECOWAS wide integration. Furthermore, the zone coefficient is not surprising because existing papers have demonstrated that WAMZ and WAEMU seem to follow a divergent path although the official message is about cooperation (Aryeetey, 2001; Richards et al, 2010 and Javed, 2013).

In summary, the estimates demonstrate that history, HDI, state capacity and FDI contain useful information in explaining the quality of institutions in ECOWAS while not so much regional trade as a percentage of GDP. Moreover, the zone coefficient demonstrates that WAEMU enjoy better institutional quality and standardisation compared to WAEMU. Therefore,

[22] Note that 1 was designated for WAEMU and 0 WAMZ in the zone coefficients

these two zones should work in tandem within ECOWAS in order to accelerate the integration process.

5.6 Summary and conclusion

The aim of this chapter was twofold. First, to specify a model underpinned by institutional theories that could be estimated. The second aim was to estimate the conjunction of factors which determine institutional quality and to test the process of convergence.

We argue that research into the determinants of institutional quality should be treated as a process where they exist due to demand. This enabled us to establish the direction of causality in the initial stages as underpinned by institutional theories. These theories demonstrate that institutions emanate from repeated interaction of agents that lead to the emergence of norms that could ultimately determine the quality of institutions. In this way, we demonstrate that in the context of an RTA like ECOWAS, the quality of institutions is a function of the degree of interaction of members. These interactions manifest themselves through trade, investment and other initiatives to share development. Although endogeneity could not be eliminated entirely in this area of research, our assumptions justified specifying a model where IQ is the dependent variable. We also argued that the history of West Africa could influence current institutions (Rodney, 1981; Acemoglu et al, 2001 and Nunn, 2008). Therefore, we use initial values to represent history of IQ and whether the presence of the two monetary zones impact on institutional quality.

The main contribution to the existing literature is the exclusive use of ECOWAS dataset that have so far not been done in the existing literature particularly in the context of RTA. Furthermore, we specified a model underpinned by institutional theories and assumed the direction of calusality. The results are mixed as shown in Table 5.13 and 5.14. The key findings demonstrated that the cooperation of ECOWAS could accelerate the integration process and improve the quality of institutions. We found that history (initial values) the level of development, the capacity of the state and FDI contain useful information in explaining the quality of institutions in the region. However, regional trade as a percentage of GDP only positively impact on regulatory quality and rule of law compared to the other IQ's. Furthermore, the findings demonstrated that the presence of WAMZ and WAEMU negatively impact on the quality of institutional and that WAEMU enjoy better IQ relative to WAMZ. From a policy point of view, ECOWAS could prioritise strengthening development and democracy if they want to improve the quality of institutions in tandem with increase in production that has the potential to increase demand for regional products. Furthermore, the results show that ECOWAS has the potential to achieve convergence of institutions. However, the rate of convergence could accelerate if WAMZ and WAEMU members work in tandem within ECOWAS. It suggests that the presence of WAEMU and WAMZ as separate entities slows the convergence process. The convergence rate in WAEMU is lower than WAMZ. Therefore, WAMZ could adopt successes of WAEMU or let ECOWAS be the main driver of the integration process.

Hence, the key findings are that ECOWAS should strengthen development and democracy in the short run to improve the quality institutions and the process of convergence. Furthermore, the success of the convergence process could depend on the extent to which WAMZ and WAEMU cooperate.

CHAPTER SIX
Conclusions and policy implications

6.0 Introduction

This thesis examines the quality of institutions and the process of convergence in the ECOWAS region in order to deepen our understanding of institutions and to inform policy about their deep integration scheme. The thesis is divided into three research questions that addressed the issue. The motivation of the thesis emanated from the assertion in some papers that south-south integration schemes like that of ECOWAS are undesirable due to several factors including the production of similar goods and no production complementarities. (Cernat, 2001; Schiff and Winters, 2003; Venables, 2003 and Hertzenberg, 2011). Other factors that contribute to weak trade flows include high tariffs and non-tariff barriers to trade (Milner, Morrissey and Zgovu, 2009; Leyaro and Morrissey, 2010 and Hertzenberg, 2011) As a result, comparative advantage and economies of scale could not explain the basis for south-south trade since they tend to produce similar products and no production complementarities respectively.

Nonetheless, the number of RTAs among developing nations (south-south) has increased or past ones strengtheneded in the last three decades. The WTO Report (2014 p. 7) estimated that the number of RTAs increased by 372% (123 to 581) from 1948 to 1994. Therefore, it is desirable to study RTAs in developing nations because they are increasing, or old ones strengthened despite the arguments against their south-south integration.

ECOWAS was formed in 1975 and a revised 1993 ECOWAS treaty was signed. The revised 1993 treaty created institutions such as WAMA and EBID with a view to accelerate regional integration and development, including maintaining peace and security in the region and to tackle climate change. Therefore, the increased number of RTAs among developing nations like ECOWAS suggests that there is no consensus about the undesirability of south-south integration schemes.

In 1990, ECOWAS became a free trade area (FTA) with the launch of the ECOWAS TLS (Omorogbe, 1993 and Aryeetey, 2001). The launch of the ECOWAS CET in 2015 made ECOWAS a customs union and marked a further step toward deeper integration. Hence, intra-ECOWAS trade shouldn't incur extra costs associated with tariffs given that all protocols on free movement of goods and people have been signed. However, the non-tariff barriers pose fundamental challenges to ECOWAS trade because they make the implementation of ECOWAS protocols difficult. We assert in this thesis that weakness in the quality of institutions is among the non-tariff barriers that pose the greatest challenge to ECOWAS trade because they add to trade costs, coordination failures and uncertainty. Furthermore, we assert that the undesirability of south-south integration schemes could in part, be attributed to weak institutions given its associated coordination failures, uncertainty and high trade costs.

Therefore, the main goal of the thesis was to examine the conjunction of factors that determine the quality of institutions and the process of convergence in the ECOWAS region that has not been sufficiently done in the existing literature. Furthermore, identifying factors that drive institutional quality could inform policy about harmonisation of institutions in the region.

As a first step, we argue that it is useful to examine the development and evolution of institutions in West Africa from a historical perspective starting from the Empires of Western Sudan to the present day. This will enable us to understand how the present institutions in West Africa came about and the historical changes that took place. This was the basis for the discussion in chapter three.

Our examination in chapter three demonstrated that regional trade institutions, including, common currencies, common trade taxes and rules, protection of trade routes and single administration existed in the pre-independence era in West Africa relative to the current situation. Moreover, although the trading quantities were unknown, intra-West African trade and trade with the rest of the world through the trans-Saharan routes was extensive during the Empirehood era given that the Empires emerged through trade expansion (Hopkins, 2014). The colonial era also created common institutions such as single currency, standardise trade rules and single administration system that could have been useful for deep integration. Nonetheless, some of these institutions were abandoned after independence especially among the Anglophone and Portuguese countries. Therefore, the ECOWAS deep integration scheme could learn best practices from their historical past especially in the standardization of institutions. We assert that if south-south integration schemes are undesirable, then intra-ECOWAS trade should be lower than ECOWAS trade with the rest of the world.

The second research question examines ECOWAS trade relative to each other and relative to the rest of the world. We examine ECOWAS trade by product category base on the SITC 1 product classification. Furthermore, we examine ECOWAS trade potential and some of the catalyst and impediments to regional trade. The key findings in the second research question demonstrated that intra-ECOWAS trade is low relative to each other and relative to the rest of the world. Moreover, the low share of ECOWAS trade could in part, be attributed to the non-tariff barriers especially weak regional trade institutions. Indeed, the examination in the first research question demonstrated that the pre-independence era that was characterized by more standardized regional trade institutions enjoyed high trade level relative to the present era that is characterized by weak regional trade institutions. Therefore, the quality of institutions could determine the extent to which RTAs are desirable.

The third research question assumes that econometric examination of the conjunction of factors that determine the quality of institutions could shed light on what could be done to improve them. The econometric estimates found that the level of development, state capacity and foreign direct investment positively impact on institutional quality in the region. Moreover, the findings also demonstrate that history and the quality of institutions of trade partners in ECOWAS does impact on the quality of some institutions especially regulatory quality and rule of law. We also find that the quality of institutions in the region exhibit convergence although at a slow pace. Furthermore, improving regional trade institutions and the success of the convergence process could depend on the extent to which WAMZ and WAEMU work together as one monetary zone rather than separate monetary zone.

The process of integrating WAMZ and WAEMU and the extent to which ECOWAS can reflect on its historical good practices regarding regionalism could depend on the quality of regional policies and access to funding. Since individual chapters have summaries, this chapter will mainly discuss the findings and their policy implication for the ECOWAS.

6.1 Findings and policy implications

The thesis is divided into three research questions. The first research question focuses on the development of regional trade institutions in West Africa while the second research question examines ECOWAS trade and trade potentials and some of the factors that contribute to the low level of ECOWAS trade. The third research question focus on the econometric analysis of the determinants of the quality of institutions and the process of convergence.

The discussions on the second research question demonstrated that ECOWAS trade is low. It was shown that the ECOWAS contribution to global trade was 0.5% on average from 2000 to 2010 (EDA Report, 2013) while intra-ECOWAS trade as a proportion of their total trade stalled at 10% on average from 1995 to 2015 (UNCTADSTAT, 2016). This trend is similar with other developing nations. Africa's share of world trade was 3.1%, while intra-African trade as a share of their total trade was15.5% in 2014 (WTO, International Trade Statistics, 2014 and UNCTADSTAT, 2016). Moreover, ECOWAS depends on a narrow range of primary products for global exports. An estimated 66% to 74% of ECOWAS exports to the world are minerals and fuel related products in contrast with Asia, which has a diversified export sector (Rugwabiza, 2012; Badiane et al, 2013; Fundira, 2015 and Author’s calculation; Table 4.7). The traditional trade theories predict that ECOWAS should trade less among themselves since they produce similar products with a weak manufacturing sector and lacks production complementarities. Hence, the low share of intra-ECOWAS trade could suggest that south-south integration schemes are less beneficial. Therefore, from the perspective of traditional trade theories, the current level of ECOWAS trade should be expected.

However, our RCA estimates demonstrated that ECOWAS has the potential to increase regional and international trade. For example, our estimates show that ECOWAS has RCA in food and live animal, mineral fuels, crude materials and animals and vegetable oils and fats in the world. Furthermore, the RCA of these product categories differs from one country to another. Our TCI estimates also suggest that ECOWAS members could trade among themselves by exploiting economies of scale through production complementarity. Therefore, ECOWAS member states could allocate production base on their individual comparative advantages and to exploit regional production complementarities. Moreover, the traditional trade theories would suggest that these three product categories should be relatively cheaper than their counterpart imports from the rest of the world. Nonetheless, our estimates demonstrated that ECOWAS trade deficit in food and live animals was US$2.5billion in 2013. Therefore, there may be other factors preventing ECOWAS from exploiting its RCA potential.

In the absence of exploiting their comparative advantage, ECOWAS firms could exploit increasing returns to scale if the production complementarity beyond national borders is encouraged. Our TCI estimates show that this is feasible. The agro-industry could be particularly useful given that some ECOWAS countries have comparative advantage in the primary sector and could complement each other’s production beyond national borders. Furthermore, the region could expand manufacturing akin to what Asia did. The new trade theories have discussed the extent to which countries with similar economic structures like ECOWAS members could trade because of production complementarities. This initiative would require regional investment into processing and manufacturing. Investments require costing and the identification of several sources of financing. For example, the Gambia imports an estimated 175,000 tons of rice per year on average outside ECOWAS (The Point, 2014). However, an estimated 50% of ECOWAS arable land is underutilised while irrigation has been neglected. Indeed, SSA land under irrigation is estimated at 4% of total land use for cultivation (Senghor, 2009 and Dijk, 2011). Therefore, the low share of intra-ECOWAS trade could be associated with underproduction.

Furthermore, the low share of intra-ECOWAS trade could also be attributed to several other factors including high tariffs and non-tariff barriers. Progress has been made in launching the ECOWAS CET in 2015 while WAEMU already had a single currency and a central bank. All the protocols on the free movement of goods and people have been signed. Therefore, there should be no extra costs associated with ECOWAS cross-border trade.

However, ECOWAS cross-border trade still face extra costs in the form of non-tariff barriers. Some non-tariff barriers such as quotas have been removed. Other non-tariff barriers such as transportation and communication networks are gradually improving. Nonetheless, research has found that ECOWAS cross-border trade costs additional US$100 to US$129 per trip in bribe payments at border points and unofficial roadblocks (Cissokho et al, 2012 and Keyser, 2012). Furthermore, about 50% of intra-African trade financial settlements are conducted by banks outside the continent, which adds to transaction costs (Sy, 2014).

This thesis asserts that these extra costs to ECOWAS cross-border trade is associated with weak institutions, including regulation of cross-border trade, protection of trade routes from corruption, enforcement of ECOWAS protocols and non-convertibility of ECOWAS currencies. Therefore, it is useful to examine the conjunction of factors that contributes to the weakness in the quality of institutions.

Our examination demonstrated that regional trade institutions were more developed and standardized across West Africa before the current countries gained their independence. Societal norms and political consensus, such as the 'Mande charter' and the coming of Islam created a discipline that provided confidence in the ability to create common institutions. The Empires of Western Sudan established standardized regional trade institutions, including common currencies (cowries), protected trade routes through the royal armies and established courts to settle trade disputes and punishment mechanism. The effective functioning of the trade institutions was consolidated by the existence of a single administration. The lesser kings agreed to be ruled by a single administration in order to maintain overall peace and to coordinate the implementation of common institutions. The expansion of trade played an important role in stimulating the development of common regional trade institutions since it was perceived that divergence in the coordination of trade institutions could not maximize trade potential. Therefore, we could not directly associate the low share of intra-ECOWAS trade to weak pre-colonial institution.

The colonial era also created common trade institutions, including common currencies and central banks, courts to settle disputes through the chiefs, standardize trade rules such as common external tariff and single administration system. The British colonies shared the British West African Shilling (BWAS) as their common currency while the West African Currency Board (WACB) acted as the central bank. The French colonies also shared the French Colonies of Africa (CFA) as their common currency with a single central bank. Therefore, the BWAS and CFA replaced the cowries as monetarized currencies, which signaled a historical change in the use of common currencies in West Africa, although they were intended to promote international trade rather than regional trade.

Hence, regional trade institutions were not entirely weak in the pre-colonial and colonial era and that we could not directly associate them with the low share of intra-ECOWAS trade today. Historical changes in governance led to the loss of some facets of these regional trade institutions from the late 1950s, when West Africans began to gain their independence.

Nonetheless, ECOWAS has the potentials to reflect on historical good practices in order to accelerate the integration process and to exploit the full potential of regional trade. We demonstrated that reflecting on historical good practices has the potential to remove four institutional failures that act as barriers to current regional trade, namely; the protection of trade routes from bribes and unofficial roadblocks, punishment of violators of ECOWAS protocols through the courts, sensitization of cross-border traders to their rights under the ECOWAS treaty and the establishment of a common currency or at least facilitate their convertibility. We argue that some ECOWAS institutions are vital in the integration process and the process of convergence of regional institutions, namely; the West African Monetary Agency (WAMA), ECOWAS Bank for Investment and Development (EBID), the community court of justice and the ECOWAS parliament. While WAMA and EBID could facilitate the launch of a common currency and a central bank or at least ensure the convertibility of currencies, the court of justice and ECOWAS parliament could address the extra costs incurred by cross-border traders through the implementation and enforcement of the ECOWAS customs union status. Moreover, EBID could also act as a bank that raise funds from several sources in order to meet the necessary investments that would strengthen the institutional framework, increase production with a view to accelerate the integration process.

Furthermore, the implementation and enforcement of protocols could be done akin to what existed in the pre-independence era. For example, security personnel from individual member states could patrol trade routes in order to remove unofficial roadblocks in tandem with avenues for traders to report abuse of ECOWAS protocols. In addition, the training of customs officials at the border points on the ECOWAS protocols, and the legal implications for collecting bribes could be initiated. The Joint Border Posts (JBP) which are currently being constructed is a step in the right direction if it is done in tandem with joint training of customs officials. However, the JPB alone are not sufficient. Increase in customs official’s remuneration could remove the opportunity to take bribes. The ECOWAS commission could also station representatives at the border points in order to monitor the effective implementation of protocols and to report to the commission in order to draw lessons from the ongoing activities. During the Empires of

Western Sudan, the kings had representatives in each lesser kingdom that monitored the arrangements made.

Furthermore, the West African enterprise network (WAEN) could be strengthened in order to help disseminate information to cross-border traders about their rights under the ECOWAS treaty. As of now, WAEN members are in 13 ECOWAS countries and are skewed towards creating opportunities for international trade rather than promoting regional trade. Similarly, its members are drawn from the formal business sector, while the main drivers of intra-ECOWAS trade are in the informal sector without direct business registration (Meagher, 2003 and Golub et al, 2009). Hence, an integrated regional market could help reduce information search costs and smoothen distribution channels that could lead to demand for better institutions. Brenton (2012) has found that increasing competition in regional trade, especially the distribution channels could reduce transportation costs by 50%, which could stimulate production, consumption, and minimize loss of foodstuffs. Therefore, the coordination failures and high costs associated with weak institutions could be addressed if ECOWAS can reflect on historical good practices.

Furthermore, ECOWAS members have eight separate currencies. These eight currencies are non-convertible, although ECOWAS intends to launch a common currency by 2020 conditional on members meeting their convergence criteria. The convergence of WAMZ has been difficult to achieve because some of the criteria is unrealistic and unattainable. The idea that fiscal deficit to GDP should be less than or equal to 3% is based on the notion that some countries would be denied the ability to appreciate their currency in order to manage their debt or who should pay for their debt. This could be addressed by pulling all regional debt into one account although this will require political willingness. We argue that WAMA and EBID are in place to facilitate the launch of a common currency and central bank or at least enable the convertibility. The West African Unit of Account (WAUA) could act as a peg to determine the value of each currency. The WAUA is currently limited to a traveler’s check to facilitate trade and tourism and is convertible to all, the West African currencies (Ansa, 2014). However, the travelers check is not widely used by cross-border traders. Furthermore, although WAMA could act as the clearing house, its functions are mainly limited between the central banks. ECOWAS could save costs and prevent overlaps by incorporating EBID and West African Monetary Institute (WAMI) into WAMA.

The extent to which currencies promote trade requires convertibility or commonality. In the pre-independence era, a single central bank ensured that a single currency function effectively. Moreover, the central banks issued currencies because they were governed by a single administration system. Therefore, ECOWAS could pursue similar objectives in order to make policy initiatives sustainable. Masson and Pattillo (2001) highlighted various options for monetary integration in ECOWAS including a common currency, single central bank, pegging their currencies to an external anchor or a basket of currencies. This would require political commitment to give up sovereignty. From an economic point of view, giving up sovereignty for a regional administration system could save costs from administrative overlaps. Indeed, there is consensus among some economists that deeper economic integration could not be sustained without a political union (Krugman and Obstfeld, 2009).

Therefore, the key policy implication from the first two research questions demonstrated that the low share of ECOWAS trade can improve if ECOWAS can reflect on historical good practices. This would require political commitment to give up sovereignty for a regional administration system akin to what existed in the pre-independence era. Furthermore, some current ECOWAS institutions could be used to facilitate the harmonisation of institutions in order to strengthen the integration process.

To further examine the importance of institutional quality in a deep integration process, we use econometric methods to analyze the conjunction of factors that determine the quality of institutions. Although this area of research lacks clear models underpinned by institutional theories, we made certain assumptions about the direction of causality. We assume that endogeneity could not be removed entirely in this area of research.

Therefore, an attempt should be made to justify the expected nature of relationship. Research has established that differences in the quality of institutions have accounted for differences in trade and development (Straub, 2000; Acemoglu et al, 2001; Rodrik and Subramanian, 2003 and Rodrik, 2007). Nonetheless, the quality of institutions differs in space and time around the world which suggest no emulation taking place and divergence. Therefore, it is plausible to examine factors that determine institutional quality. Since economic institutions emanate from repeated interaction of agents, their quality should be determined by the extent to which repeated interaction leads to demand for better institutions in order to smoothen future interactions.

Therefore, we argue that the quality of institutions within an RTA is a function of the level of development, the capacity of the state, investment, the past value of institutions and the quality of institutions of trade partners in a region. In the context of ECOWAS, the presence of two monetary zones is also expected to impact on the quality of institutions. We derived a model to capture this relationship. This was useful because if weak institutions have been found to add to trade costs, uncertainty and coordination failures, then examining the determinants of institutional quality could inform policy about how to improve them. Since deep integration also requires the harmonisation of institutions, we also tested the process of convergence of institutions using Ben-David's (1996) model.

The findings suggest that WAMZ and WAEMU must cooperate more within the framework of ECOWAS or act as one monetary zone in order to accelerate the integration and convergence process. Streamlining WAMZ and WAEMU could save costs of operation and raise funds for regional development. For example, the cost of pegging the CFA to the Euro through the French treasury could be channeled to WAMA if WAMA is strengthened as a depository bank and banker of the banks in the region. Indeed, Sene (2014) and Koulibaly (2014) highlighted that WAEMU must break away from the French treasury in order to promote growth and trade beyond their current levels. Moreover, our convergence test using Ben-David (1996) simple model suggests that the quality of institutions exhibit convergence within ECOWAS although the process is slow, especially in the presence of separate monetary zones. From a policy point of view, we wanted to know how long it could take to achieve full convergence and some factors that could influence this process. We divided ECOWAS members into their existing monetary zones. Our findings were quite interesting and revealed some of the challenges faced by ECOWAS in terms of integration. Our tests demonstrated that the half-life convergence rate for ECOWAS members is lower although WAEMU had a lower rate in some institution. Therefore, greater cooperation between the two monetary zones is required.

Furthermore, we found that development, state capacity, FDI and regional trade to some extent contain useful information in explaining the quality of institutions in ECOWAS. These findings are consistent with previous findings (La Porta, 1999; Straub, 2000; Rijckeghem et al, 2001; Islam et al, 2002; Acemoglu et al, 2005; Mocan, 2008; Levechenko, 2012 and Alonso et al, 2013). Moreover, the history also contain memory in explaining current institutions which is consistent with previous findings (Rodney, 1981; Acemoglu et al, 2001 and Nunn, 2008). Furthermore, other ECOWAS members also act as pull factors in the improvement of institutions which demonstrate some degree of emulation and supports our convergence results.

Therefore, our findings demonstrated that ECOWAS has the potential to increase regional trade and deepen their integration conditional on improving the quality of institutions. We argue that reflection on their historical past and strengthening development and democracy could give confidence that economic and political union is feasible given that it existed. This will require political commitment to do so.

However, to attain economic and political union status requires investment in all fields including production, institutions and communications. We proposed several measures that could raise funds to help ECOWAS meet their objectives. Loans and grants from international institutions have been a conventional ways of financing projects in Africa given the continent’s inability to collect sufficient domestic taxes (Tanzi and Zee, 2000 and Ekpo, 2004). Moreover, aid for trade has been contributing to developing regional infrastructure that can increase trade (Helble, 2012). Nonetheless, regional initiatives such as increasing the community levy from 0.5% to 1% in the medium term could raise additional funds. The 0.5% community levies collected an estimated US$400 million in 2016 that amounts to 70% of the total levy they expected to collect (Vanguard, 2016). Therefore, a 1% community levy could generate an estimated US$550 million for investment in many sectors, although it could imply higher import prices in the short run. Nonetheless, Sachs (2005) highlighted that taxation is the price a society should pay for civilization. Therefore, to increase regional production and improve the quality of institutions could be addressed in part through financing from the community levy.

In addition, ECOWAS could raise funds through community initiatives such as banquets and sports events to finance specific projects. These initiatives may be unconventional although they are inherent in many traditions in West Africa. The West African diaspora is also increasing its relevance in contributing to growth and poverty reduction. In 2014, West African's diaspora remitted an estimated US$26 billion, which is more than the GDP of many ECOWAS countries (African Development Bank, 2015). A 0.5 pence levy on every £100 remitted could have generate US$130 million for ECOWAS. This requires greater planning and coordination with money transfer agencies and trust building between ECOWAS and the West African Diasporas. Furthermore, ECOWAS could engage the diaspora through EBID to raise funds through bonds or through direct investments. These funds could be used for direct investment in communication, infrastructure, strengthening institutions and production. Goretti and Weisfeld (2008) found that unless ECOWAS increase their production of products that are of high domestic demand, regional trade will not exceed 14% of total trade soon. Therefore, ECOWAS's vision to expand regional trade to 40% by 2030 should be turned into reality through a regional strategic framework that includes costs of projects, establishment of clear sources of finance, setting timelines and mechanism to measure progress.

In summary, the main lessons from this thesis demonstrated that to increase intra-ECOWAS trade in part requires improving the quality of institutions and exploiting their RCA and TCI. Our discussions demonstrated that weak institutions add to trade cost, uncertainty and coordination failures. Therefore, the low share of intra-ECOWAS trade could in part, be attributed to weak institutions and low production. We argue that several measures could be used to improve the quality of institutions, the process of convergence and increase production. The key is to ensure that WAEMU and WAMZ act as one monetary zone while strengthening development and democracy. However, these measures require investment. We propose altering the community levy, exploiting domestic ways to raise revenue though banquets and raising bonds through EBID. The West African diaspora could contribute in the financing of the ECOWAS deep integration if the initiatives are put in place to do so.

In the long term, improving the institutional framework and deepening integration requires a system of single administration or federation for sustenance and effective implementation. This will require political commitment from member states. Reflecting on historical good practices from the pre-independence era should demonstrate to ECOWAS that economic and political union is feasible given that it existed in the past in the region. Therefore, the undesirability of south-south integration schemes does not lie with the lack of production complementarities and the production of similar product ranges. Instead, it is the weakness in the quality of institutions that is associated with the undesirability of south-south integration. Therefore, improving the institutional framework at the regional level could enhance the desirability of RTAs in the developing world.

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Appendix A: The Raw Data

Appendix A1: Institutional quality indices

Countries	Institutional quality Indices	1996	1998	2000	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Benin	Control of Corruption	-0.93	-0.60	-0.49	-0.79	-0.57	-0.49	-0.97	-0.63	-0.49	-0.53	-0.67	-0.74	-0.64	-0.93	-0.84	-0.78	-0.61
Benin	Government Effectiveness	-0.41	-0.27	-0.27	-0.38	-0.33	-0.36	-0.62	-0.57	-0.52	-0.45	-0.56	-0.58	-0.52	-0.51	-0.49	-0.46	-0.62
Benin	Political Stability and Absence of Violence/Terrorism	0.96	0.66	0.72	0.74	0.66	0.26	0.45	0.51	0.33	0.33	0.38	0.22	0.29	0.32	0.26	0.04	0.00
Benin	Regulatory Quality	-0.20	-0.17	-0.21	-0.44	-0.50	-0.48	-0.57	-0.42	-0.43	-0.49	-0.33	-0.32	-0.33	-0.38	-0.40	-0.56	-0.56
Benin	Rule of Law	-0.19	-0.14	-0.27	-0.34	-0.52	-0.59	-0.59	-0.56	-0.55	-0.56	-0.67	-0.70	-0.71	-0.62	-0.62	-0.55	-0.58
Benin	Voice and Accountability	0.12	0.34	0.36	0.00	0.24	0.10	0.01	0.33	0.34	0.30	0.33	0.29	0.14	0.10	0.13	0.25	0.28
Burkina Faso	Control of Corruption	0.22	-0.24	-0.14	-0.02	-0.03	-0.15	-0.09	-0.32	-0.35	-0.32	-0.38	-0.39	-0.39	-0.51	-0.57	-0.53	-0.34
Burkina Faso	Government Effectiveness	-1.02	-0.75	-0.62	-0.72	-0.62	-0.53	-0.59	-0.75	-0.74	-0.47	-0.58	-0.56	-0.54	-0.62	-0.66	-0.58	-0.59
Burkina Faso	Political Stability and Absence of Violence/Terrorism	-0.41	-0.20	-0.01	-0.37	0.03	-0.11	-0.08	0.14	0.29	0.10	0.01	-0.15	-0.58	-0.59	-0.80	-0.80	-0.65
Burkina Faso	Regulatory Quality	-0.25	-0.39	-0.12	-0.14	-0.35	-0.34	-0.42	-0.32	-0.25	-0.17	-0.09	-0.14	-0.16	-0.11	-0.17	-0.29	-0.36
Burkina Faso	Rule of Law	-1.03	-0.85	-0.67	-0.68	-0.56	-0.56	-0.51	-0.41	-0.39	-0.34	-0.20	-0.18	-0.37	-0.42	-0.52	-0.54	-0.53
Burkina Faso	Voice and Accountability	-0.73	-0.57	-0.36	-0.48	-0.33	-0.45	-0.46	-0.38	-0.34	-0.32	-0.32	-0.28	-0.31	-0.33	-0.29	-0.41	-0.19
Cabo Verde	Control of Corruption		-0.32	0.13	0.38	0.29	0.27	0.34	0.67	0.79	0.79	0.77	0.80	0.86	0.81	0.78	0.90	0.91
Cabo Verde	Government Effectiveness		0.35	0.30	-0.12	-0.10	-0.07	-0.23	0.12	0.35	0.06	0.04	-0.02	0.16	0.12	0.10	0.08	0.15
Cabo Verde	Political Stability and Absence of Violence/Terrorism	0.94	1.02	1.12	0.65	0.90	1.07	0.78	0.96	0.90	0.83	0.84	0.85	0.72	0.81	0.77	0.38	0.80
Cabo Verde	Regulatory Quality	-0.58	-0.21	0.00	-0.29	-0.23	-0.34	-0.31	-0.20	-0.20	-0.05	0.02	-0.04	0.07	0.06	-0.10	-0.17	-0.26
Cabo Verde	Rule of Law	0.77	0.64	0.63	0.19	0.14	0.27	0.31	0.58	0.56	0.51	0.48	0.43	0.48	0.49	0.50	0.59	0.55
Cabo Verde	Voice and Accountability	0.91	0.91	0.73	0.66	0.67	0.70	0.49	0.75	0.84	0.93	0.88	0.89	0.97	0.93	0.91	0.96	0.95
Cote d'Ivoire	Control of Corruption	0.20	-0.30	-0.69	-0.82	-0.98	-1.22	-1.25	-1.20	-1.07	-1.09	-1.08	-1.14	-1.02	-0.84	-0.77	-0.41	-0.42
Cote d'Ivoire	Government Effectiveness	-0.06	-0.21	-0.88	-0.94	-1.02	-1.27	-1.36	-1.20	-1.21	-1.21	-1.08	-1.26	-1.13	-1.08	-0.91	-0.81	-0.65
Cote d'Ivoire	Political Stability and Absence of Violence/Terrorism	0.01	-0.26	-1.32	-1.99	-1.84	-2.16	-2.30	-1.89	-1.89	-1.82	-1.28	-1.56	-1.40	-1.26	-1.02	-1.02	-0.86

Cote d'Ivoire	Regulatory Quality	-0.48	-0.26	-0.54	-0.45	-0.82	-0.96	-0.96	-0.91	-0.84	-0.89	-0.95	-0.91	-0.86	-0.76	-0.73	-0.58	-0.52
Cote d'Ivoire	Rule of Law	-0.82	-0.94	-1.19	-1.38	-1.46	-1.42	-1.53	-1.49	-1.49	-1.45	-1.26	-1.24	-1.29	-1.10	-0.93	-0.61	-0.62
Cote d'Ivoire	Voice and Accountability	-0.64	-0.73	-1.10	-1.20	-1.25	-1.30	-1.36	-1.36	-1.28	-1.24	-1.11	-1.10	-1.13	-0.81	-0.78	-0.53	-0.44
Gambia, The	Control of Corruption	-0.44	-0.53	-0.41	-0.44	-0.33	-0.59	-0.71	-0.74	-0.75	-0.75	-0.56	-0.56	-0.50	-0.63	-0.69	-0.68	-0.77
Gambia, The	Government Effectiveness	-0.61	-0.48	-0.50	-0.67	-0.47	-0.50	-0.67	-0.69	-0.57	-0.72	-0.63	-0.66	-0.61	-0.50	-0.70	-0.64	-0.89
Gambia, The	Political Stability and Absence of Violence/Terrorism	0.47	0.59	0.45	0.72	0.32	0.21	0.25	-0.02	0.06	0.08	0.14	0.08	0.01	0.00	-0.05	-0.15	0.01
Gambia, The	Regulatory Quality	-0.95	-0.40	-0.28	-0.55	-0.46	-0.42	-0.51	-0.38	-0.35	-0.38	-0.32	-0.38	-0.27	-0.21	-0.35	-0.44	-0.49
Gambia, The	Rule of Law	0.10	0.04	-0.13	-0.29	0.16	-0.30	-0.28	-0.30	-0.24	-0.35	-0.44	-0.51	-0.51	-0.54	-0.60	-0.63	-0.66
Gambia, The	Voice and Accountability	-1.32	-0.98	-1.14	-0.64	-0.38	-0.60	-0.97	-0.88	-0.88	-0.85	-1.01	-1.09	-1.22	-1.28	-1.24	-1.26	-1.48
Ghana	Control of Corruption	-0.22	-0.17	-0.07	-0.29	-0.24	-0.22	-0.36	0.00	0.07	-0.04	0.03	0.06	0.04	-0.09	-0.07	-0.22	-0.18
Ghana	Government Effectiveness	-0.11	-0.14	0.02	-0.13	-0.19	-0.16	-0.16	0.13	0.11	0.04	-0.04	-0.04	-0.05	-0.04	-0.10	-0.29	-0.26
Ghana	Political Stability and Absence of Violence/Terrorism	-0.32	-0.24	-0.44	-0.25	-0.02	0.01	0.18	0.02	-0.06	-0.02	0.04	0.02	0.16	0.11	0.03	-0.13	0.03
Ghana	Regulatory Quality	-0.38	-0.25	-0.10	-0.47	-0.28	-0.35	-0.11	-0.07	-0.05	-0.03	0.09	0.13	0.13	0.13	0.08	-0.01	-0.03
Ghana	Rule of Law	-0.34	-0.44	0.09	-0.03	0.00	-0.15	-0.14	0.00	-0.01	-0.10	-0.08	-0.06	-0.04	-0.02	0.12	0.02	0.12
Ghana	Voice and Accountability	-0.34	-0.36	-0.08	-0.06	0.28	0.15	0.24	0.37	0.46	0.38	0.49	0.49	0.46	0.41	0.42	0.47	0.51
Guinea	Control of Corruption	-0.46	-0.73	-0.75	-0.52	-0.75	-0.84	-1.00	-1.07	-1.26	-1.16	-1.05	-1.19	-1.11	-1.06	-1.04	-1.07	-0.97
Guinea	Government Effectiveness	-1.24	-0.80	-0.83	-0.95	-0.76	-0.88	-1.06	-1.32	-1.26	-1.19	-1.03	-1.13	-1.15	-1.26	-1.17	-1.24	-1.14
Guinea	Political Stability and Absence of Violence/Terrorism	-1.23	-0.69	-2.03	-1.56	-0.84	-1.05	-1.18	-1.89	-2.37	-2.10	-2.09	-1.68	-1.39	-1.28	-1.22	-0.94	-0.45
Guinea	Regulatory Quality	-0.71	-0.51	-0.60	-1.01	-0.98	-0.94	-1.05	-1.21	-1.23	-1.20	-1.13	-1.08	-1.00	-1.01	-0.99	-1.04	-0.86
Guinea	Rule of Law	-1.51	-1.27	-1.42	-0.98	-1.11	-1.24	-1.35	-1.42	-1.47	-1.54	-1.54	-1.50	-1.47	-1.42	-1.40	-1.37	-1.17
Guinea	Voice and Accountability	-1.35	-1.19	-1.18	-1.33	-1.22	-1.28	-1.14	-1.24	-1.40	-1.45	-1.30	-0.95	-0.94	-1.06	-1.06	-0.89	-0.89
Guinea-Bissau	Control of Corruption	-1.09	-1.14	-0.97	-0.85	-1.07	-1.14	-1.09	-0.98	-1.11	-1.08	-1.10	-1.06	-1.05	-1.22	-1.28	-1.51	-1.43
Guinea-Bissau	Government Effectiveness	-1.47	-1.31	-1.06	-1.15	-1.31	-1.49	-1.38	-1.13	-1.11	-1.06	-1.03	-1.04	-1.04	-1.23	-1.43	-1.60	-1.62
Guinea-Bissau	Political Stability and Absence of Violence/Terrorism	-1.72	-1.95	-0.50	-0.87	-0.53	-0.39	-0.57	-0.48	-0.44	-0.69	-0.65	-0.65	-0.73	-0.96	-0.89	-0.69	-0.44

Guinea-Bissau	Regulatory Quality	-0.82	-1.33	-1.24	-1.02	-0.86	-1.08	-1.11	-0.94	-1.10	-1.21	-1.18	-1.14	-1.12	-1.22	-1.26	-1.19	-1.20
Guinea-Bissau	Rule of Law	-2.02	-2.07	-1.39	-1.20	-1.18	-1.18	-1.28	-1.27	-1.35	-1.42	-1.36	-1.35	-1.32	-1.51	-1.60	-1.35	-1.30
Guinea-Bissau	Voice and Accountability	-1.16	-1.14	-0.76	-0.75	-1.13	-0.85	-0.37	-0.70	-0.78	-0.80	-0.81	-0.90	-0.93	-1.39	-1.38	-0.93	-0.81
Liberia	Control of Corruption	-1.74	-1.73	-1.37	-1.17	-1.22	-1.27	-1.15	-0.64	-0.33	-0.70	-0.56	-0.53	-0.62	-0.58	-0.68	-0.78	-0.61
Liberia	Government Effectiveness	-1.87	-1.98	-1.84	-1.61	-1.51	-1.59	-1.46	-1.32	-1.25	-1.31	-1.24	-1.27	-1.24	-1.15	-1.36	-1.34	-1.37
Liberia	Political Stability and Absence of Violence/Terrorism	-2.55	-1.84	-2.04	-2.28	-2.21	-1.41	-1.36	-1.31	-1.25	-1.28	-1.08	-0.46	-0.42	-0.48	-0.46	-0.60	-0.74
Liberia	Regulatory Quality	-1.98	-2.11	-1.78	-1.74	-1.69	-1.88	-1.63	-1.48	-1.20	-1.34	-1.19	-1.05	-1.09	-1.04	-0.90	-0.85	-0.88
Liberia	Rule of Law	-2.23	-2.11	-2.11	-1.86	-1.69	-1.71	-1.49	-1.00	-1.01	-1.18	-1.08	-1.01	-0.97	-0.91	-0.91	-0.85	-0.87
Liberia	Voice and Accountability	-1.49	-1.02	-1.16	-1.38	-1.53	-1.31	-0.38	-0.23	-0.20	-0.25	-0.20	-0.26	-0.31	-0.35	-0.43	-0.31	-0.26
Mali	Control of Corruption	-0.44	-0.63	-0.66	-0.53	-0.54	-0.50	-0.40	-0.41	-0.34	-0.45	-0.64	-0.65	-0.57	-0.79	-0.74	-0.72	-0.65
Mali	Government Effectiveness	-1.21	-1.05	-0.87	-0.60	-0.60	-0.62	-0.69	-0.69	-0.73	-0.76	-0.79	-0.84	-0.79	-0.98	-0.88	-1.08	-0.91
Mali	Political Stability and Absence of Violence/Terrorism	0.23	0.33	0.14	0.29	0.23	0.48	0.19	0.37	0.20	0.17	-0.08	-0.21	-0.68	-2.02	-1.70	-1.70	-1.66
Mali	Regulatory Quality	-0.48	-0.23	-0.10	-0.46	-0.51	-0.46	-0.51	-0.44	-0.34	-0.39	-0.39	-0.48	-0.38	-0.41	-0.49	-0.59	-0.57
Mali	Rule of Law	-0.53	-0.52	-0.46	-0.32	-0.03	-0.17	-0.14	-0.27	-0.17	-0.32	-0.35	-0.44	-0.50	-0.68	-0.75	-0.65	-0.76
Mali	Voice and Accountability	-0.12	-0.17	-0.11	0.27	0.38	0.29	0.25	0.27	0.19	0.16	0.04	0.13	0.15	-0.53	-0.31	-0.20	-0.24
Niger	Control of Corruption	-1.09	-1.03	-0.94	-1.07	-1.02	-0.85	-0.72	-0.86	-0.77	-0.75	-0.61	-0.67	-0.59	-0.62	-0.56	-0.63	-0.58
Niger	Government Effectiveness	-1.24	-1.08	-1.08	-0.89	-0.75	-0.69	-0.79	-0.79	-0.79	-0.72	-0.66	-0.67	-0.63	-0.69	-0.73	-0.70	-0.61
Niger	Political Stability and Absence of Violence/Terrorism	-0.11	-0.42	0.00	-0.25	0.01	-0.52	-0.48	-0.23	-0.46	-0.67	-1.16	-1.17	-0.87	-1.16	-1.32	-1.18	-0.98
Niger	Regulatory Quality	-1.16	-0.69	-0.61	-0.71	-0.64	-0.58	-0.42	-0.49	-0.50	-0.42	-0.48	-0.51	-0.52	-0.60	-0.56	-0.71	-0.73
Niger	Rule of Law	-1.00	-0.74	-0.93	-0.78	-0.66	-0.73	-0.80	-0.64	-0.65	-0.73	-0.52	-0.52	-0.39	-0.68	-0.70	-0.69	-0.61
Niger	Voice and Accountability	-1.83	-1.61	-0.20	-0.28	-0.17	-0.18	-0.30	-0.38	-0.43	-0.50	-0.78	-0.67	-0.29	-0.33	-0.35	-0.24	-0.25
Nigeria	Control of Corruption	-1.15	-1.07	-1.13	-1.33	-1.32	-1.30	-1.16	-1.07	-0.98	-0.81	-0.98	-1.00	-1.13	-1.15	-1.21	-1.27	-1.10
Nigeria	Government Effectiveness	-0.98	-1.12	-0.96	-1.06	-0.96	-0.91	-0.88	-0.96	-1.04	-0.97	-1.20	-1.15	-1.08	-0.99	-0.99	-1.18	-0.95
Nigeria	Political Stability and Absence of Violence/Terrorism	-1.17	-0.69	-1.52	-1.69	-1.65	-1.72	-1.65	-2.03	-2.01	-1.86	-1.95	-2.19	-1.94	-2.06	-2.08	-2.13	-2.07
Nigeria	Regulatory Quality	-0.82	-0.93	-0.74	-1.23	-1.24	-1.32	-0.77	-0.89	-0.87	-0.78	-0.73	-0.71	-0.67	-0.71	-0.66	-0.81	-0.84
Nigeria	Rule of Law	-1.26	-1.27	-1.10	-1.48	-1.52	-1.43	-1.36	-1.08	-1.06	-1.06	-1.16	-1.17	-1.22	-1.18	-1.15	-1.09	-1.04

Nigeria	Voice and Accountability	-1.66	-1.22	-0.58	-0.71	-0.64	-0.77	-0.84	-0.64	-0.79	-0.76	-0.87	-0.80	-0.75	-0.73	-0.73	-0.65	-0.44
Senegal	Control of Corruption	-0.22	-0.20	-0.11	0.31	-0.14	-0.05	-0.03	-0.42	-0.54	-0.53	-0.53	-0.69	-0.53	-0.28	-0.25	0.02	0.03
Senegal	Government Effectiveness	0.02	-0.12	-0.12	0.02	-0.26	-0.18	-0.25	-0.32	-0.46	-0.13	-0.50	-0.56	-0.47	-0.46	-0.41	-0.39	-0.44
Senegal	Political Stability and Absence of Violence/Terrorism	-0.72	-1.06	-0.70	-0.34	-0.29	-0.02	-0.22	-0.28	-0.25	-0.15	-0.20	-0.43	-0.30	-0.12	-0.06	-0.19	-0.17
Senegal	Regulatory Quality	-0.21	-0.19	-0.13	-0.19	-0.23	-0.26	-0.26	-0.32	-0.34	-0.30	-0.29	-0.27	-0.21	-0.08	-0.05	-0.21	-0.18
Senegal	Rule of Law	-0.23	-0.03	0.01	0.04	-0.08	-0.02	-0.02	-0.24	-0.25	-0.29	-0.37	-0.40	-0.48	-0.31	-0.27	-0.11	-0.15
Senegal	Voice and Accountability	0.00	-0.12	0.08	0.33	0.26	0.18	0.03	0.01	-0.24	-0.28	-0.33	-0.32	-0.26	-0.03	0.03	0.27	0.25
Sierra Leone	Control of Corruption	-0.77	-0.87	-0.91	-0.75	-0.91	-0.88	-1.09	-1.01	-0.90	-0.96	-0.94	-0.77	-0.83	-0.95	-0.90	-0.95	-0.78
Sierra Leone	Government Effectiveness	-1.47	-1.46	-1.46	-1.51	-1.23	-1.10	-1.36	-1.14	-1.18	-1.18	-1.21	-1.21	-1.19	-1.21	-1.20	-1.22	-1.26
Sierra Leone	Political Stability and Absence of Violence/Terrorism	-1.81	-2.27	-1.97	-0.86	-1.12	-0.44	-0.43	-0.26	-0.02	-0.21	-0.30	-0.24	-0.17	-0.28	-0.17	-0.13	-0.10
Sierra Leone	Regulatory Quality	-1.62	-1.29	-1.38	-1.26	-1.14	-1.02	-1.08	-1.14	-1.07	-0.97	-0.78	-0.73	-0.70	-0.69	-0.70	-0.79	-0.87
Sierra Leone	Rule of Law	-1.48	-1.19	-1.47	-1.33	-1.21	-1.17	-1.18	-1.02	-1.02	-0.96	-0.92	-0.96	-0.88	-0.86	-0.87	-0.93	-0.90
Sierra Leone	Voice and Accountability	-0.69	-1.38	-1.57	-0.68	-0.37	-0.32	-0.52	-0.38	-0.25	-0.17	-0.26	-0.18	-0.23	-0.35	-0.37	-0.31	-0.30
Togo	Control of Corruption	-0.76	-0.63	-0.66	-0.77	-0.90	-0.93	-0.79	-1.05	-1.00	-0.98	-1.03	-0.97	-1.00	-1.01	-1.04	-0.92	-0.71
Togo	Government Effectiveness	-0.80	-0.98	-1.24	-1.37	-1.55	-1.60	-1.50	-1.56	-1.55	-1.51	-1.39	-1.39	-1.36	-1.31	-1.29	-1.25	-1.18
Togo	Political Stability and Absence of Violence/Terrorism	-0.49	-0.72	-0.40	-0.05	-0.24	-0.33	-1.46	-0.55	-0.36	-0.18	-0.19	-0.20	-0.18	-0.41	-0.38	-0.18	-0.17
Togo	Regulatory Quality	-0.40	-0.49	-0.66	-0.73	-0.70	-0.78	-0.84	-0.89	-0.94	-0.96	-0.86	-0.87	-1.00	-0.84	-0.92	-0.82	-0.82
Togo	Rule of Law	-0.76	-0.76	-0.71	-0.79	-0.98	-1.13	-1.09	-0.97	-0.95	-0.84	-0.88	-0.91	-0.86	-0.93	-0.98	-0.87	-0.80
Togo	Voice and Accountability	-1.09	-1.24	-1.22	-1.47	-1.25	-1.27	-1.28	-1.28	-1.16	-1.08	-1.04	-1.00	-0.95	-1.04	-0.96	-0.83	-0.75

Source: World Bank World Governance Indicators

Note: No observation was made in 1997, 1999 and 2001.

Appendix A2: Rescaled Institutional Quality Indices

Note: 20 was added in all the dataset (N*T) institutional quality indices (IQ) in Appendix A1; where N is the number of countries and T is the number of years. This was done in order to make the figures from Appendix A1 positive.

Appendix A3: Definition of the Institutional quality indices in appendix A1 and A2

Indicator Name	Long definition
Control of Corruption: Estimate	Control of Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.
Government Effectiveness: Estimate	Government Effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.
Political Stability and Absence of Violence/Terrorism: Estimate	Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.
Regulatory Quality: Estimate	Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.
Rule of Law: Estimate	Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.
Voice and Accountability: Estimate	Voice and Accountability captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.

Source: World Bank World Governance Indicators

Appendix A4: State Capacity

Country Name	Series Name	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Benin	General government final consumption expenditure (% of GDP)	13.51	13.21	13.12	12.19	12.07	12.04	11.60	13.09	13.00	13.44	14.44	14.27	15.39	16.87	16.85	16.39	16.66	16.51	15.32	17.02
Burkina Faso	General government final consumption expenditure (% of GDP)	24.39	23.73	22.30	17.83	20.66	25.79	21.18	19.87	20.77	19.77	21.57	23.85	21.36	21.63	20.64	20.57	20.84	21.34	21.96	22.45
Cabo Verde	General government final consumption expenditure (% of GDP)												17.46	16.88	18.18	18.43	18.52	17.27	17.46	18.45	
Cote d'Ivoire	General government final consumption expenditure (% of GDP)	10.46	15.05	13.72	13.84	14.35	13.61	12.98	14.80	14.90	14.43	13.59	13.34	12.67	12.64	12.18	11.25	14.67	12.74	12.33	14.34
Gambia, The	General government final consumption expenditure (% of GDP)	11.44	11.27	9.99	10.34	11.23	11.37	9.92	8.75	8.08	7.07	6.33	7.24	9.73	10.46	10.03	10.65	9.57	9.57	10.73	10.08
Ghana	General government final consumption expenditure (% of GDP)	12.04	12.36	10.32	10.84	10.17	9.72	9.87	11.53	12.17	15.31	11.30	11.56	11.24	11.73	10.36	16.64	20.89	19.92	17.98	19.16
Guinea	General government final consumption expenditure (% of GDP)	7.47	7.39	6.81	6.96	7.08	7.35	8.19	8.18	6.95	6.99	8.11	6.76	8.74	11.33	15.03	10.55	9.52	9.68	9.06	8.60
Guinea-Bissau	General government final consumption expenditure (% of GDP)	6.56	7.02	9.28	10.78	18.57	14.63	14.38	16.49	14.18	14.61	14.58	15.12	11.88	15.48	15.22	13.08	12.43	11.70	13.02	10.89
Liberia	General government final consumption expenditure (% of GDP)					7.53	6.73	3.54	4.30	10.88	11.20	9.35	13.61	18.33	15.76	14.24	15.19	15.45	19.15	16.67	16.86
Mali	General government final consumption expenditure (% of GDP)	10.98	11.20	18.74	14.68	16.42	15.00	15.36	15.57	15.46	13.85	13.26	13.95	15.57	14.57	15.69	18.79	15.48	17.24	16.71	16.64

Niger	General government final consumption expenditure (% of GDP)	11.45	14.08	13.66	16.04	13.04	12.38	12.24	15.58	16.33	15.60	15.01	15.65	15.01	16.21	13.64	14.43	13.22	13.14	14.97	16.68
Nigeria	General government final consumption expenditure (% of GDP)	10.02	13.00	13.97	6.98	8.34	8.21	6.71	5.15	6.73	6.81	6.86	10.18	11.64	12.96	8.71	8.49	8.20	7.16	6.46	5.94
Senegal	General government final consumption expenditure (% of GDP)	13.84	13.42	12.78	13.33	12.79	12.61	13.27	13.00	13.46	13.30	13.65	14.18	13.46	14.28	14.81	15.54	15.32	15.59	16.58	16.45
Sierra Leone	General government final consumption expenditure (% of GDP)	10.87	9.01	8.93	11.47	14.33	13.15	14.09	11.95	10.49	10.02	10.10	8.65	9.65	10.36	10.25	10.07	10.20	8.71	7.15	10.25
Togo	General government final consumption expenditure (% of GDP)	12.02	10.30	10.86	9.73	10.45	10.01	8.42	10.32	10.33	11.49	11.43	9.18		11.14	9.05	9.57	12.90	15.50	14.22	15.90

Source: World Development Indicators Database. Note: General government final consumption expenditure (% of GDP) is used here as proxy for state capacity.

Appendix A5: Foreign Direct Investment Inflow (millions of current US$)

	Benin	Burkina Faso	Cabo Verde	Côte d'Ivoire	Gambia	Ghana	Guinea	Guinea-Bissau	Liberia	Mali	Niger	Nigeria	Senegal	Sierra Leone	Togo
1996	13.49	16.23	28.53	269.19	18.35	120.00	23.77	1.03	-132.13	43.40	2.35	2190.68	5.47	0.66	14.47
1997	13.71	9.77	11.58	415.46	20.57	81.80	17.30	11.48	213.82	69.73	16.62	1642.47	176.81	1.80	18.50
1998	32.71	4.41	8.76	760.10	23.70	167.40	17.85	4.41	190.31	8.87	-1.19	1210.11	60.34	0.10	19.49
1999	39.26	7.93	61.13	235.35	49.48	243.70	63.45	0.73	256.26	2.18	0.28	1177.71	153.25	0.53	31.68
2000	59.74	23.11	43.45	234.70	43.52	114.90	9.94	0.70	20.80	82.44	8.44	1309.67	62.94	38.88	41.47
2001	43.86	6.27	12.68	272.68	35.48	89.30	1.68	0.40	8.30	121.73	22.90	1277.42	31.94	9.84	63.58
2002	13.51	15.03	38.52	212.58	42.83	58.90	30.00	3.55	2.80	243.80	2.40	2040.18	78.05	10.41	53.36
2003	44.73	29.12	33.50	165.39	10.70	110.02	82.80	3.49	372.22	132.26	11.47	2171.39	52.49	8.62	33.73
2004	63.84	14.35	68.03	282.98	55.53	139.27	97.90	9.18	75.36	101.00	20.32	2127.09	77.03	61.15	59.36
2005	53.04	34.15	81.55	311.92	53.65	144.97	105.00	8.00	82.81	223.80	30.29	4978.26	44.59	83.18	76.99
2006	53.20	33.59	130.65	318.86	82.21	636.01	125.00	17.33	107.85	83.39	50.54	4897.81	220.32	58.77	77.34

2007	255.24	343.54	190.39	426.78	76.46	855.40	385.90	18.58	131.60	72.79	129.04	6086.73	297.43	96.58	49.16
2008	169.84	105.77	209.22	446.15	70.10	1220.42	255.77	5.14	283.80	180.28	340.43	8248.64	397.63	57.62	23.88
2009	134.29	100.90	174.31	377.13	39.44	2897.10	140.85	17.45	217.80	748.35	790.76	8649.53	320.03	110.85	48.53
2010	176.80	34.62	158.82	338.94	37.12	2527.36	101.35	33.22	449.96	405.90	940.32	6098.96	266.11	238.44	85.83
2011	161.09	143.66	154.69	301.58	36.07	3237.39	956.12	25.02	785.30	556.15	1065.79	8914.89	338.22	950.48	711.09
2012	229.58	329.30	125.58	330.28	40.88	3293.43	606.47	6.62	984.60	397.87	841.28	7127.39	276.18	722.45	121.52
2013	360.24	490.26	69.56	407.47	24.85	3226.33	133.96	19.64	1061.27	307.85	719.13	5608.45	311.28	429.68	183.55
2014	405.20	355.93	180.26	438.77	35.10	3356.99	77.06	28.85	276.70	144.02	821.87	4693.83	402.56	403.91	53.95
2015	149.70	231.81	115.74	494.21	10.59	3192.30	48.23	18.58	626.96	275.41	529.27	3064.17	409.00	263.00	257.76

Source: United Nations Conference on Trade and Development (UNCTAD) statistics database (Trains).

Appendix A6: Trade Data by Country to the rest of ECOWAS

Import and Export of each Country to ECOWAS (total 1000s US$)						Import and Export of each Country to ECOWAS (total 1000s US$)					
Country	Region	Year	Exports (X)	Imports (M)	TTL trade (X+M)	Country	Region	Year	Exports (X)	Imports (M)	TTL trade (X+M)
Benin	ECOWAS	1996	9473.27	73111.25	82584.53	Cape Verde	ECOWAS	1996	64.49	8731.68	8796.17
Benin	ECOWAS	1997	5151.04	86772.65	91923.68	Cape Verde	ECOWAS	1997	22.98	5255.99	5278.96
Benin	ECOWAS	1998	8354.87	124119.11	132473.98	Cape Verde	ECOWAS	1998	43.53	4198.76	4242.29
Benin	ECOWAS	1999	21581.79	80804.28	102386.07	Cape Verde	ECOWAS	1999	12.67	4064.56	4077.22
Benin	ECOWAS	2000	13648.75	107676.82	121325.57	Cape Verde	ECOWAS	2000	71.32	2648.28	2719.59
Benin	ECOWAS	2001	20128.85	140772.23	160901.08	Cape Verde	ECOWAS	2001	82.47	2997.22	3079.69
Benin	ECOWAS	2002	49865.91	166858.40	216724.31	Cape Verde	ECOWAS	2002	144.48	4132.21	4276.69
Benin	ECOWAS	2003	33869.32	188567.40	222436.72	Cape Verde	ECOWAS	2003	53.89	14485.39	14539.27
Benin	ECOWAS	2004	56136.91	222169.69	278306.60	Cape Verde	ECOWAS	2004	116.05	7139.70	7255.75
Benin	ECOWAS	2005	54680.74	215342.51	270023.25	Cape Verde	ECOWAS	2005	50.94	8089.81	8140.74
Benin	ECOWAS	2006	78105.82	245399.30	323505.11	Cape Verde	ECOWAS	2006	859.50	5985.07	6844.57
Benin	ECOWAS	2007	90351.03	301047.22	391398.25	Cape Verde	ECOWAS	2007	69.84	8164.61	8234.44
Benin	ECOWAS	2008	129672.06	272258.80	401930.87	Cape Verde	ECOWAS	2008		12383.32	12383.32
Benin	ECOWAS	2009	210746.73	278420.58	489167.31	Cape Verde	ECOWAS	2009	20.83	13330.66	13351.49
Benin	ECOWAS	2010	231443.14	328471.44	559914.57	Cape Verde	ECOWAS	2010	166.31	10165.54	10331.85
Benin	ECOWAS	2011	59553.88	433079.74	492633.63	Cape Verde	ECOWAS	2011	153.88	7070.48	7224.36
Benin	ECOWAS	2012	60466.84	463552.91	524019.75	Cape Verde	ECOWAS	2012	92.91	9193.46	9286.37
Benin	ECOWAS	2013	88093.38	477410.41	565503.79	Cape Verde	ECOWAS	2013	96.14	7876.81	7972.95
Benin	ECOWAS	2014	99777.83	431379.57	531157.40	Cape Verde	ECOWAS	2014	27.44	5123.20	5150.64
Benin	ECOWAS	2015	134607.17	383131.23	517738.40	Cape Verde	ECOWAS	2015	207.84	6386.39	6594.23

Burkina Faso	ECOWAS	1996	156664.04	147772.39	304436.44	Cote d'Ivoire	ECOWAS	1996	392794.04	584309.88	977103.91
Burkina Faso	ECOWAS	1997	42518.66	176204.92	218723.58	Cote d'Ivoire	ECOWAS	1997	841906.33	462302.62	1304208.95
Burkina Faso	ECOWAS	1998	49541.11	189379.13	238920.24	Cote d'Ivoire	ECOWAS	1998	985302.62	365136.61	1350439.23
Burkina Faso	ECOWAS	1999	78462.23	206534.23	284996.46	Cote d'Ivoire	ECOWAS	1999	903462.86	436190.04	1339652.90
Burkina Faso	ECOWAS	2000	44200.60	211959.22	256159.82	Cote d'Ivoire	ECOWAS	2000	975737.25	696031.80	1671769.05
Burkina Faso	ECOWAS	2001	37451.76	151598.07	189049.83	Cote d'Ivoire	ECOWAS	2001	899077.08	526076.43	1425153.50
Burkina Faso	ECOWAS	2002	36039.76	154918.89	190958.65	Cote d'Ivoire	ECOWAS	2002	1249738.44	421231.68	1670970.11
Burkina Faso	ECOWAS	2003	278409.59	347582.17	625991.75	Cote d'Ivoire	ECOWAS	2003	959006.98	570987.76	1529994.74
Burkina Faso	ECOWAS	2004	310724.75	424779.45	735504.20	Cote d'Ivoire	ECOWAS	2004	1469164.63	1016520.72	2485685.35
Burkina Faso	ECOWAS	2005	243395.17	514191.35	757586.52	Cote d'Ivoire	ECOWAS	2005	1804420.26	1511992.35	3316412.61
Burkina Faso	ECOWAS	2006			0.00	Cote d'Ivoire	ECOWAS	2006	1917553.84	1699850.07	3617403.91
Burkina Faso	ECOWAS	2007	121815.41	425435.96	547251.37	Cote d'Ivoire	ECOWAS	2007	2047145.69	1742735.18	3789880.87
Burkina Faso	ECOWAS	2008	108137.02	520223.51	628360.54	Cote d'Ivoire	ECOWAS	2008	2543842.54	2491508.79	5035351.33
Burkina Faso	ECOWAS	2009	107606.08	479049.37	586655.45	Cote d'Ivoire	ECOWAS	2009	2501490.23	1594082.22	4095572.46
Burkina Faso	ECOWAS	2010	116336.05	549115.42	665451.47	Cote d'Ivoire	ECOWAS	2010	2554156.48	2178566.77	4732723.25
Burkina Faso	ECOWAS	2011	121818.41	625093.10	746911.51	Cote d'Ivoire	ECOWAS	2011	2343242.71	1734898.80	4078141.51
Burkina Faso	ECOWAS	2012	173617.69	816723.29	990340.98	Cote d'Ivoire	ECOWAS	2012	2777882.29	2800729.22	5578611.51

Burkina Faso	ECOWAS	2013	274084.50	986515.40	1260599.90	Cote d'Ivoire	ECOWAS	2013	4079193.57	3181827.79	7261021.36
Burkina Faso	ECOWAS	2014	458084.54	1819799.97	2277884.51	Cote d'Ivoire	ECOWAS	2014	2692268.95	2649643.81	5341912.77
Burkina Faso	ECOWAS	2015	259042.94	573826.83	832869.78	Cote d'Ivoire	ECOWAS	2015	1672242.50	1670433.23	3342675.73

Import and Export of each Country to ECOWAS (total 1000s US$)						Import and Export of each Country to ECOWAS (total 1000s US$)					
Country	Region	Year	Exports (X)	Imports (M)	TTL trade (X+M)	Country	Region	Year	Exports (X)	Imports (M)	TTL trade (X+M)
Gambia, The	ECOWAS	1996	2728.00	34721.49	37449.48	Guinea	ECOWAS	1996	5146.28	138939.85	144086.14
Gambia, The	ECOWAS	1997	2213.02	44745.44	46958.46	Guinea	ECOWAS	1997	7822.37	59121.49	66943.86
Gambia, The	ECOWAS	1998	1720.20	31070.34	32790.54	Guinea	ECOWAS	1998	8648.28	50897.99	59546.27
Gambia, The	ECOWAS	1999	6577.85	13745.34	20323.19	Guinea	ECOWAS	1999	4198.31	49707.77	53906.09
Gambia, The	ECOWAS	2000	7743.51	27075.05	34818.56	Guinea	ECOWAS	2000	2474.59	141658.46	144133.04
Gambia, The	ECOWAS	2001	98.82	13918.47	14017.29	Guinea	ECOWAS	2001	13921.29	89576.12	103497.41
Gambia, The	ECOWAS	2002	205.34	13328.62	13533.96	Guinea	ECOWAS	2002	3817.73	103988.40	107806.13
Gambia, The	ECOWAS	2003	93.59	13296.53	13390.12	Guinea	ECOWAS	2003			0.00
Gambia, The	ECOWAS	2004	128.20	37207.38	37335.58	Guinea	ECOWAS	2004	9338.58	193714.34	203052.92
Gambia, The	ECOWAS	2005	2570.53	39800.30	42370.83	Guinea	ECOWAS	2005	54711.15	261760.57	316471.72
Gambia, The	ECOWAS	2006	3456.34	34124.78	37581.12	Guinea	ECOWAS	2006	16295.29	178947.20	195242.49
Gambia, The	ECOWAS	2007	2958.97	34625.47	37584.44	Guinea	ECOWAS	2007	10793.03	68476.86	79269.89
Gambia, The	ECOWAS	2008	1621.46	44939.10	46560.56	Guinea	ECOWAS	2008	30401.96	63737.90	94139.86
Gambia, The	ECOWAS	2009	3307.62	53110.94	56418.56	Guinea	ECOWAS	2009			0.00
Gambia, The	ECOWAS	2010	3815.24	66040.58	69855.82	Guinea	ECOWAS	2010			0.00
Gambia, The	ECOWAS	2011	647.19	90870.65	91517.84	Guinea	ECOWAS	2011			0.00
Gambia, The	ECOWAS	2012	508.19	125339.10	125847.29	Guinea	ECOWAS	2012			0.00
Gambia, The	ECOWAS	2013	272.01	102458.32	102730.33	Guinea	ECOWAS	2013	36159.82	56493.87	92653.69
Gambia, The	ECOWAS	2014	593.11	100800.25	101393.37	Guinea	ECOWAS	2014	30252.32	71288.38	101540.70
Gambia, The	ECOWAS	2015			0.00	Guinea	ECOWAS	2015	93642.99	147059.82	240702.81
Ghana	ECOWAS	1996	92014.53	117102.16	209116.69	Guinea-Bissau	ECOWAS	1996			0.00
Ghana	ECOWAS	1997	100628.92	371029.65	471658.57	Guinea-Bissau	ECOWAS	1997			0.00

Ghana	ECOWAS	1998	63068.02	218496.58	281564.60	Guinea-Bissau	ECOWAS	1998			0.00
Ghana	ECOWAS	1999	181483.05	356997.67	538480.72	Guinea-Bissau	ECOWAS	1999			0.00
Ghana	ECOWAS	2000	142868.72	524411.35	667280.07	Guinea-Bissau	ECOWAS	2000			0.00
Ghana	ECOWAS	2001	135949.62	577421.02	713370.63	Guinea-Bissau	ECOWAS	2001			0.00
Ghana	ECOWAS	2002		468909.31	468909.31	Guinea-Bissau	ECOWAS	2002			0.00
Ghana	ECOWAS	2003	135262.19	626765.34	762027.53	Guinea-Bissau	ECOWAS	2003	1167.13	9392.87	10560.00
Ghana	ECOWAS	2004			0.00	Guinea-Bissau	ECOWAS	2004	725.43	18048.78	18774.20
Ghana	ECOWAS	2005	447081.12	663086.18	1110167.30	Guinea-Bissau	ECOWAS	2005	14.57	47964.15	47978.72
Ghana	ECOWAS	2006	557316.40	628014.56	1185330.96	Guinea-Bissau	ECOWAS	2006			0.00
Ghana	ECOWAS	2007	351491.01	734007.80	1085498.81	Guinea-Bissau	ECOWAS	2007			0.00
Ghana	ECOWAS	2008	278016.17	1080287.15	1358303.32	Guinea-Bissau	ECOWAS	2008			0.00
Ghana	ECOWAS	2009	572274.26	325510.69	897784.95	Guinea-Bissau	ECOWAS	2009			0.00
Ghana	ECOWAS	2010	478478.74	207343.39	685822.13	Guinea-Bissau	ECOWAS	2010			0.00
Ghana	ECOWAS	2011	6106597.80	1118946.67	7225544.47	Guinea-Bissau	ECOWAS	2011			0.00
Ghana	ECOWAS	2012	1801832.71	831628.68	2633461.39	Guinea-Bissau	ECOWAS	2012			0.00
Ghana	ECOWAS	2013	1118210.87	746290.42	1864501.29	Guinea-Bissau	ECOWAS	2013			0.00
Ghana	ECOWAS	2014			0.00	Guinea-Bissau	ECOWAS	2014			0.00

Ghana	ECOWAS	2015			0.00	Guinea-Bissau	ECOWAS	2015			0.00

Import and Export of each Country to ECOWAS (total 1000s US$)						Import and Export of each Country to ECOWAS (total 1000s US$)					
Country	Region	Year	Exports (X)	Imports (M)	TTL trade (X+M)	Country	Region	Year	Exports (X)	Imports (M)	TTL trade (X+M)
Mali	ECOWAS	1996	291882.49	263009.98	554892.47	Nigeria	ECOWAS	1996	715217.79	41953.78	757171.56
Mali	ECOWAS	1997	280252.44	265303.99	545556.43	Nigeria	ECOWAS	1997	808900.36	51906.70	860807.06
Mali	ECOWAS	1998	233628.01	291700.53	525328.53	Nigeria	ECOWAS	1998	538695.85	43529.39	582225.24
Mali	ECOWAS	1999	236940.45	243508.01	480448.46	Nigeria	ECOWAS	1999	1046524.44	20401.56	1066926.00
Mali	ECOWAS	2000	175150.78	304525.13	479675.91	Nigeria	ECOWAS	2000	1375589.23	77371.29	1452960.52
Mali	ECOWAS	2001	96561.10	344126.16	440687.27	Nigeria	ECOWAS	2001	818007.34	351174.85	1169182.19
Mali	ECOWAS	2002	76040.56	355688.82	431729.38	Nigeria	ECOWAS	2002	1210384.53	88433.37	1298817.90
Mali	ECOWAS	2003	93032.77	487038.84	580071.62	Nigeria	ECOWAS	2003	1092939.08	361986.21	1454925.29
Mali	ECOWAS	2004	142004.60	568061.07	710065.67	Nigeria	ECOWAS	2004			0.00
Mali	ECOWAS	2005	113210.51	680204.13	793414.64	Nigeria	ECOWAS	2005			0.00
Mali	ECOWAS	2006	96265.22	749946.45	846211.67	Nigeria	ECOWAS	2006	3719236.36	268339.66	3987576.02
Mali	ECOWAS	2007	129759.36	1009123.37	1138882.73	Nigeria	ECOWAS	2007	2286146.44	748114.00	3034260.43
Mali	ECOWAS	2008	251553.78	1114748.51	1366302.29	Nigeria	ECOWAS	2008	5932594.46	925970.28	6858564.74
Mali	ECOWAS	2009			0.00	Nigeria	ECOWAS	2009	2151228.16	71633.48	2222861.64
Mali	ECOWAS	2010	160883.06	1678220.65	1839103.71	Nigeria	ECOWAS	2010	2044824.87	182836.39	2227661.26
Mali	ECOWAS	2011	275641.07	1399882.30	1675523.37	Nigeria	ECOWAS	2011	3575004.14	743923.00	4318927.14
Mali	ECOWAS	2012	279873.45	1608531.96	1888405.41	Nigeria	ECOWAS	2012	5545052.08	151832.75	5696884.83
Mali	ECOWAS	2013			0.00	Nigeria	ECOWAS	2013	4831359.14	2205464.75	7036823.89
Mali	ECOWAS	2014			0.00	Nigeria	ECOWAS	2014	5208896.27	292778.69	5501674.96
Mali	ECOWAS	2015			0.00	Nigeria	ECOWAS	2015			0.00
Niger	ECOWAS	1996	210613.63	94062.86	304676.49	Senegal	ECOWAS	1996	88450.91	230497.83	318948.73
Niger	ECOWAS	1997	156839.16	99710.81	256549.97	Senegal	ECOWAS	1997	87411.40	233167.98	320579.37
Niger	ECOWAS	1998	185131.75	108410.79	293542.53	Senegal	ECOWAS	1998	132674.84	134367.88	267042.73
Niger	ECOWAS	1999	72035.09	118525.24	190560.33	Senegal	ECOWAS	1999	137157.69	167050.08	304207.78
Niger	ECOWAS	2000	100089.90	108652.83	208742.73	Senegal	ECOWAS	2000	151068.25	340033.61	491101.86
Niger	ECOWAS	2001	81801.01	118231.29	200032.30	Senegal	ECOWAS	2001	167594.75	231365.22	398959.97
Niger	ECOWAS	2002	87010.46	132346.27	219356.73	Senegal	ECOWAS	2002	127752.02	480062.11	607814.13
Niger	ECOWAS	2003	90794.85	169803.22	260598.07	Senegal	ECOWAS	2003	376018.09	396365.02	772383.11
Niger	ECOWAS	2004	97191.23	189506.68	286697.92	Senegal	ECOWAS	2004	459683.96	454039.94	913723.90

Niger	ECOWAS	2005	97823.64	210773.22	308596.87	Senegal	ECOWAS	2005	555701.31	504768.36	1060469.67
Niger	ECOWAS	2006	85816.73	202798.59	288615.32	Senegal	ECOWAS	2006	261190.34	281488.54	542678.87
Niger	ECOWAS	2007	81226.17	212139.47	293365.64	Senegal	ECOWAS	2007	704816.02	582257.01	1287073.03
Niger	ECOWAS	2008	221340.44	215263.39	436603.83	Senegal	ECOWAS	2008	897225.03	1061862.04	1959087.07
Niger	ECOWAS	2009	181753.91	233574.47	415328.38	Senegal	ECOWAS	2009	800218.70	625597.22	1425815.92
Niger	ECOWAS	2010	74606.06	254853.27	329459.33	Senegal	ECOWAS	2010	923043.63	633421.87	1556465.50
Niger	ECOWAS	2011	106073.36	277665.84	383739.19	Senegal	ECOWAS	2011	943861.22	782313.79	1726175.00
Niger	ECOWAS	2012	368126.13	318847.42	686973.55	Senegal	ECOWAS	2012	962967.02	995313.34	1958280.36
Niger	ECOWAS	2013	451497.53	354081.87	805579.41	Senegal	ECOWAS	2013	1024759.15	898652.61	1923411.76
Niger	ECOWAS	2014	325764.30	371554.59	697318.88	Senegal	ECOWAS	2014	1075239.31	739149.66	1814388.97
Niger	ECOWAS	2015	177907.38	342858.85	520766.23	Senegal	ECOWAS	2015	986637.61	606015.83	1592653.44

Import and Export of each Country to ECOWAS (total 1000s US$)						Import and Export of each Country to ECOWAS (total 1000s US$)					
Country	Region	Year	Exports (X)	Imports (M)	TTL trade (X+M)	Country	Region	Year	Exports (X)	Imports (M)	TTL trade (X+M)
Sierra Leone	ECOWAS	1996			0.00	Togo	ECOWAS	1996	15202.54	157833.65	173036.20
Sierra Leone	ECOWAS	1997			0.00	Togo	ECOWAS	1997	18717.25	129738.03	148455.28
Sierra Leone	ECOWAS	1998			0.00	Togo	ECOWAS	1998	40633.30	107537.87	148171.17
Sierra Leone	ECOWAS	1999			0.00	Togo	ECOWAS	1999	58043.41	153043.80	211087.21
Sierra Leone	ECOWAS	2000	1968.36	37110.66	39079.02	Togo	ECOWAS	2000	67367.56	57719.19	125086.75
Sierra Leone	ECOWAS	2001			0.00	Togo	ECOWAS	2001	128186.26	43378.28	171564.53
Sierra Leone	ECOWAS	2002	29.63	141017.35	141046.97	Togo	ECOWAS	2002	142441.70	50361.30	192802.99
Sierra Leone	ECOWAS	2003			0.00	Togo	ECOWAS	2003	230224.94	77194.65	307419.59
Sierra Leone	ECOWAS	2004			0.00	Togo	ECOWAS	2004	226581.28	88018.07	314599.35
Sierra Leone	ECOWAS	2005			0.00	Togo	ECOWAS	2005	242812.05	71233.93	314045.98
Sierra Leone	ECOWAS	2006			0.00		ECOWAS	2006		80409.65	80409.65
Sierra Leone	ECOWAS	2007			0.00	Togo	ECOWAS	2007	145292.16	162431.22	307723.39
Sierra Leone	ECOWAS	2008			0.00	Togo	ECOWAS	2008	307958.38	127221.15	435179.53
Sierra Leone	ECOWAS	2009			0.00	Togo	ECOWAS	2009	368060.02	132486.97	500546.98
Sierra Leone	ECOWAS	2010			0.00	Togo	ECOWAS	2010	119061.38	155537.87	274599.25
Sierra Leone	ECOWAS	2011			0.00	Togo	ECOWAS	2011	466859.39	168804.96	635664.35
Sierra Leone	ECOWAS	2012			0.00	Togo	ECOWAS	2012	456161.22	204248.51	660409.73
Sierra Leone	ECOWAS	2013			0.00	Togo	ECOWAS	2013	535947.15	157847.69	693794.84
Sierra Leone	ECOWAS	2014	21682.48	822740.90	844423.38	Togo	ECOWAS	2014	405805.24	152445.59	558250.84
Sierra Leone	ECOWAS	2015	4967.71	497927.01	502894.72	Togo	ECOWAS	2015	366429.24	178713.86	545143.10

Source: World Integrated Trade Solution (WITS). Note: No data was available for Liberia and some years are missing for selected countries especially Guinea Bissau and Sierra Leone.

Appendix A7: Regional Trade and GDP Data (computed regional trade as % of GDP)

			X+M		convert to 1000s US$	
Country	Region	Year	TTL trade	GDP (constant 2010 US$)	GDP (constant 2010 US$)	Regional trade % of GDP
Benin	ECOWAS	1996	82584.53	3888602421	3888602	2.12
Benin	ECOWAS	1997	91923.68	4111601652	4111602	2.24
Benin	ECOWAS	1998	132474	4274462693	4274463	3.10
Benin	ECOWAS	1999	102386.1	4502780954	4502781	2.27
Benin	ECOWAS	2000	121325.6	4766643562	4766644	2.55
Benin	ECOWAS	2001	160901.1	5020725248	5020725	3.20
Benin	ECOWAS	2002	216724.3	5253911327	5253911	4.13
Benin	ECOWAS	2003	222436.7	5434858389	5434858	4.09
Benin	ECOWAS	2004	278306.6	5675602454	5675602	4.90
Benin	ECOWAS	2005	270023.3	5772744796	5772745	4.68
Benin	ECOWAS	2006	323505.1	6000595826	6000596	5.39
Benin	ECOWAS	2007	391398.2	6359822427	6359822	6.15
Benin	ECOWAS	2008	401930.9	6671033591	6671034	6.03
Benin	ECOWAS	2009	489167.3	6825749998	6825750	7.17
Benin	ECOWAS	2010	559914.6	6970240895	6970241	8.03
Benin	ECOWAS	2011	492633.6	7176751732	7176752	6.86
Benin	ECOWAS	2012	524019.7	7521973830	7521974	6.97
Benin	ECOWAS	2013	565503.8	8063036668	8063037	7.01
Benin	ECOWAS	2014	531157.4	8575645914	8575646	6.19
Benin	ECOWAS	2015	517738.4	8755259214	8755259	5.91
Burkina Faso	ECOWAS	1996	304436.4	3930392032	3930392	7.75
Burkina Faso	ECOWAS	1997	218723.6	4178668401	4178668	5.23
Burkina Faso	ECOWAS	1998	238920.2	4484033772	4484034	5.33
Burkina Faso	ECOWAS	1999	284996.5	4816039657	4816040	5.92
Burkina Faso	ECOWAS	2000	256159.8	4903703229	4903703	5.22
Burkina Faso	ECOWAS	2001	189049.8	5228004716	5228005	3.62
Burkina Faso	ECOWAS	2002	190958.7	5455579987	5455580	3.50

Burkina Faso	ECOWAS	2003	625991.8	5881248337	5881248	10.64
Burkina Faso	ECOWAS	2004	735504.2	6144638535	6144639	11.97
Burkina Faso	ECOWAS	2005	757586.5	6676878621	6676879	11.35
Burkina Faso	ECOWAS	2006	652419	7094394431	7094394	9.20
Burkina Faso	ECOWAS	2007	547251.4	7495582799	7495583	7.30
Burkina Faso	ECOWAS	2008	628360.5	8042347948	8042348	7.81
Burkina Faso	ECOWAS	2009	586655.5	8280563450	8280563	7.08
Burkina Faso	ECOWAS	2010	665451.5	8979966766	8979967	7.41
Burkina Faso	ECOWAS	2011	746911.5	9565619495	9565619	7.81
Burkina Faso	ECOWAS	2012	990341	10182857809	10182858	9.73
Burkina Faso	ECOWAS	2013	1260600	10469470948	10469471	12.04
Burkina Faso	ECOWAS	2014	2277885	10907717217	10907717	20.88
Burkina Faso	ECOWAS	2015	832869.8	11343810190	11343810.19	7.34

			X+M		convert to 1000s US$	
Country	Region	Year	TTL trade	GDP (constant 2010 US$)	GDP (constant 2010 US$)	Regional trade % of GDP
Cape Verde	ECOWAS	1996	8796.171	596807529.5	596807.5295	1.47
Cape Verde	ECOWAS	1997	5278.963	663163133.2	663163.1332	0.80
Cape Verde	ECOWAS	1998	4242.286	746173157.1	746173.1571	0.57
Cape Verde	ECOWAS	1999	4077.224	829913547.9	829913.5479	0.49
Cape Verde	ECOWAS	2000	2719.591	948465609.7	948465.6097	0.29
Cape Verde	ECOWAS	2001	3079.692	969632085	969632.085	0.32
Cape Verde	ECOWAS	2002	4276.685	1020546411	1020546.411	0.42
Cape Verde	ECOWAS	2003	14539.27	1063167076	1063167.076	1.37
Cape Verde	ECOWAS	2004	7255.746	1171578994	1171578.994	0.62
Cape Verde	ECOWAS	2005	8140.744	1252563900	1252563.9	0.65
Cape Verde	ECOWAS	2006	6844.566	1352565476	1352565.476	0.51
Cape Verde	ECOWAS	2007	8234.444	1557758965	1557758.965	0.53
Cape Verde	ECOWAS	2008	12428.65	1661358044	1661358.044	0.75
Cape Verde	ECOWAS	2009	13351.49	1640251720	1640251.72	0.81
Cape Verde	ECOWAS	2010	10331.85	1664310770	1664310.77	0.62
Cape Verde	ECOWAS	2011	7224.356	1730365372	1730365.372	0.42
Cape Verde	ECOWAS	2012	9286.366	1749086512	1749086.512	0.53
Cape Verde	ECOWAS	2013	7972.951	1763128136	1763128.136	0.45

Cape Verde	ECOWAS	2014	5150.643	1773904599	1773904.599	0.29
Cape Verde	ECOWAS	2015	6594.233	1792815240	1792815.24	0.37
Cote d'Ivoire	ECOWAS	1996	977103.9	20585330896	20585330.9	4.75
Cote d'Ivoire	ECOWAS	1997	1304209	21355953698	21355953.7	6.11
Cote d'Ivoire	ECOWAS	1998	1350439	22408947356	22408947.36	6.03
Cote d'Ivoire	ECOWAS	1999	1339653	22771418229	22771418.23	5.88
Cote d'Ivoire	ECOWAS	2000	1671769	22300414202	22300414.2	7.50
Cote d'Ivoire	ECOWAS	2001	1425154	22327480641	22327480.64	6.38
Cote d'Ivoire	ECOWAS	2002	1670970	21955138166	21955138.17	7.61
Cote d'Ivoire	ECOWAS	2003	1529995	21656650171	21656650.17	7.06
Cote d'Ivoire	ECOWAS	2004	2485685	21923410906	21923410.91	11.34
Cote d'Ivoire	ECOWAS	2005	3316413	22300767039	22300767.04	14.87
Cote d'Ivoire	ECOWAS	2006	3617404	22638811513	22638811.51	15.98
Cote d'Ivoire	ECOWAS	2007	3789881	23038394864	23038394.86	16.45
Cote d'Ivoire	ECOWAS	2008	5035351	23624224724	23624224.72	21.31
Cote d'Ivoire	ECOWAS	2009	4095572	24392355457	24392355.46	16.79
Cote d'Ivoire	ECOWAS	2010	4732723	24884505035	24884505.03	19.02
Cote d'Ivoire	ECOWAS	2011	4078142	23792758396	23792758.4	17.14
Cote d'Ivoire	ECOWAS	2012	5578612	26340131050	26340131.05	21.18
Cote d'Ivoire	ECOWAS	2013	3768758	28681616270	28681616.27	13.14
Cote d'Ivoire	ECOWAS	2014	5341913	31203899802	31203899.8	17.12
Cote d'Ivoire	ECOWAS	2015	3342676	34063231935	34063231.94	9.81

			X+M		convert to 1000s US$	
Country	Region	Year	TTL trade	GDP (constant 2010 US$)	GDP (constant 2010 US$)	Regional trade % of GDP
Gambia, The	ECOWAS	1996	37449.48	536162432.5	536162.4325	6.98
Gambia, The	ECOWAS	1997	46958.46	562434386.8	562434.3868	8.35
Gambia, The	ECOWAS	1998	32790.54	582119582	582119.582	5.63
Gambia, The	ECOWAS	1999	20323.19	619375231.2	619375.2312	3.28
Gambia, The	ECOWAS	2000	34818.57	653440870	653440.87	5.33
Gambia, The	ECOWAS	2001	14017.29	691340442	691340.442	2.03
Gambia, The	ECOWAS	2002	13533.96	668871875.5	668871.8755	2.02
Gambia, The	ECOWAS	2003	13390.12	714823372.1	714823.3721	1.87
Gambia, The	ECOWAS	2004	37335.58	765218419.3	765218.4193	4.88

Gambia, The	ECOWAS	2005	42370.83	758012541.8	758012.5418	5.59
Gambia, The	ECOWAS	2006	37581.12	766533358.5	766533.3585	4.90
Gambia, The	ECOWAS	2007	37584.44	794366380.5	794366.3805	4.73
Gambia, The	ECOWAS	2008	46560.56	839920448.1	839920.4481	5.54
Gambia, The	ECOWAS	2009	56418.56	894092762.5	894092.7625	6.31
Gambia, The	ECOWAS	2010	69855.82	952429030.4	952429.0304	7.33
Gambia, The	ECOWAS	2011	91517.84	911201531.5	911201.5315	10.04
Gambia, The	ECOWAS	2012	125847.3	964618263.9	964618.2639	13.05
Gambia, The	ECOWAS	2013	102730.3	1010735774	1010735.774	10.16
Gambia, The	ECOWAS	2014	101393.4	1019604583	1019604.583	9.94
Gambia, The	ECOWAS	2015	100056.4	1067687903	1067687.903	9.37
Ghana	ECOWAS	1996	209116.7	15541590590	15541590.59	1.35
Ghana	ECOWAS	1997	471658.6	16193771305	16193771.3	2.91
Ghana	ECOWAS	1998	281564.6	16954941838	16954941.84	1.66
Ghana	ECOWAS	1999	538480.7	17700958746	17700958.75	3.04
Ghana	ECOWAS	2000	667280.1	18355894240	18355894.24	3.64
Ghana	ECOWAS	2001	713370.6	19090130010	19090130.01	3.74
Ghana	ECOWAS	2002	604515.2	19949185803	19949185.8	3.03
Ghana	ECOWAS	2003	762027.5	20986543461	20986543.46	3.63
Ghana	ECOWAS	2004	936097.4	22161789893	22161789.89	4.22
Ghana	ECOWAS	2005	1110167	23469336373	23469336.37	4.73
Ghana	ECOWAS	2006	1185331	24971353346	24971353.35	4.75
Ghana	ECOWAS	2007	1085499	26056812916	26056812.92	4.17
Ghana	ECOWAS	2008	1358303	28440958948	28440958.95	4.78
Ghana	ECOWAS	2009	897784.9	29819138460	29819138.46	3.01
Ghana	ECOWAS	2010	685822.1	32174772956	32174772.96	2.13
Ghana	ECOWAS	2011	7225545	36694042412	36694042.41	19.69
Ghana	ECOWAS	2012	2633461	40103840659	40103840.66	6.57
Ghana	ECOWAS	2013	1864501	43036444041	43036444.04	4.33

Ghana	ECOWAS	2014	1791801	44751818870	44751818.87	4.00
Ghana	ECOWAS	2015	1719100	46504253396	46504253.4	3.70

			X+M		convert to 1000s US$	
Country	Region	Year	TTL trade	GDP (constant 2010 US$)	GDP (constant 2010 US$)	Regional trade % of GDP
Guinea	ECOWAS	1996	144086.1	3154196569	3154196.569	4.57
Guinea	ECOWAS	1997	66943.86	3317634528	3317634.528	2.02
Guinea	ECOWAS	1998	59546.27	3438533152	3438533.152	1.73
Guinea	ECOWAS	1999	53906.09	3569610175	3569610.175	1.51
Guinea	ECOWAS	2000	144133	3658959679	3658959.679	3.94
Guinea	ECOWAS	2001	103497.4	3792817102	3792817.102	2.73
Guinea	ECOWAS	2002	107806.1	3988701293	3988701.293	2.70
Guinea	ECOWAS	2003	0	4038504267	4038504.267	0.00
Guinea	ECOWAS	2004	203052.9	4133010005	4133010.005	4.91
Guinea	ECOWAS	2005	316471.7	4256887580	4256887.58	7.43
Guinea	ECOWAS	2006	195242.5	4363170508	4363170.508	4.47
Guinea	ECOWAS	2007	79269.89	4439861186	4439861.186	1.79
Guinea	ECOWAS	2008	94139.86	4659054145	4659054.145	2.02
Guinea	ECOWAS	2009	0	4645999835	4645999.835	0.00
Guinea	ECOWAS	2010	0	4735956493	4735956.493	0.00
Guinea	ECOWAS	2011	0	4921073735	4921073.735	0.00
Guinea	ECOWAS	2012	0	5115166394	5115166.394	0.00
Guinea	ECOWAS	2013	92653.69	5232815182	5232815.182	1.77
Guinea	ECOWAS	2014	101540.7	5253746370	5253746.37	1.93
Guinea	ECOWAS	2015	240702.8	5258999828	5258999.828	4.58
Guinea-Bissau	ECOWAS	1996	0	809528294.7	809528.2947	0.00
Guinea-Bissau	ECOWAS	1997	0	862147633.8	862147.6338	0.00
Guinea-Bissau	ECOWAS	1998	0	619884323.5	619884.3235	0.00
Guinea-Bissau	ECOWAS	1999	0	626241469.1	626241.4691	0.00

Guinea-Bissau	ECOWAS	2000	0	660227514.5	660227.5145	0.00
Guinea-Bissau	ECOWAS	2001	0	674679279.6	674679.2796	0.00
Guinea-Bissau	ECOWAS	2002	0	668032491	668032.491	0.00
Guinea-Bissau	ECOWAS	2003	10560	671830323.7	671830.3237	1.57
Guinea-Bissau	ECOWAS	2004	18774.2	690382259.6	690382.2596	2.72
Guinea-Bissau	ECOWAS	2005	47978.72	719829998.4	719829.9984	6.67
Guinea-Bissau	ECOWAS	2006	0	736456272.7	736456.2727	0.00
Guinea-Bissau	ECOWAS	2007	0	760060047.1	760060.0471	0.00
Guinea-Bissau	ECOWAS	2008	0	784438039.8	784438.0398	0.00
Guinea-Bissau	ECOWAS	2009	0	810416099.1	810416.0991	0.00
Guinea-Bissau	ECOWAS	2010	0	846332456.4	846332.4564	0.00
Guinea-Bissau	ECOWAS	2011	0	925330348.6	925330.3486	0.00
Guinea-Bissau	ECOWAS	2012	0	908693015.2	908693.0152	0.00
Guinea-Bissau	ECOWAS	2013	0	916146773.3	916146.7733	0.00
Guinea-Bissau	ECOWAS	2014	0	939426750.9	939426.7509	0.00
Guinea-Bissau	ECOWAS	2015	0	984488983.7	984488.9837	0.00

			X+M		convert to 1000s US$	
Country	Region	Year	TTL trade	GDP (constant 2010 US$)	GDP (constant 2010 US$)	Regional trade % of GDP
Mali	ECOWAS	1996	554892.5	5096827925	5096827.925	10.89
Mali	ECOWAS	1997	545556.4	5342954986	5342954.986	10.21
Mali	ECOWAS	1998	525328.5	5747505780	5747505.78	9.14
Mali	ECOWAS	1999	480448.5	6075167846	6075167.846	7.91
Mali	ECOWAS	2000	479675.9	6071472020	6071472.02	7.90
Mali	ECOWAS	2001	440687.3	7005036096	7005036.096	6.29
Mali	ECOWAS	2002	431729.4	7222634110	7222634.11	5.98
Mali	ECOWAS	2003	580071.6	7881269148	7881269.148	7.36
Mali	ECOWAS	2004	710065.7	8004216841	8004216.841	8.87
Mali	ECOWAS	2005	793414.6	8527273414	8527273.414	9.30
Mali	ECOWAS	2006	846211.7	8924830837	8924830.837	9.48

Mali	ECOWAS	2007	1138883	9236630227	9236630.227	12.33
Mali	ECOWAS	2008	1366302	9677529939	9677529.939	14.12
Mali	ECOWAS	2009	1602703	10130347923	10130347.92	15.82
Mali	ECOWAS	2010	1839104	10678749467	10678749.47	17.22
Mali	ECOWAS	2011	1675523	11024767958	11024767.96	15.20
Mali	ECOWAS	2012	1888405	10932581179	10932581.18	17.27
Mali	ECOWAS	2013	1840102	11184422458	11184422.46	16.45
Mali	ECOWAS	2014	1791798	11972181171	11972181.17	14.97
Mali	ECOWAS	2015	1743494	12686032241	12686032.24	13.74
Niger	ECOWAS	1996	304676.5	3288171553	3288171.553	9.27
Niger	ECOWAS	1997	256550	3378726668	3378726.668	7.59
Niger	ECOWAS	1998	293542.5	3730866431	3730866.431	7.87
Niger	ECOWAS	1999	190560.3	3709646817	3709646.817	5.14
Niger	ECOWAS	2000	208742.7	3657358998	3657358.998	5.71
Niger	ECOWAS	2001	200032.3	3917190239	3917190.239	5.11
Niger	ECOWAS	2002	219356.7	4034671555	4034671.555	5.44
Niger	ECOWAS	2003	260598.1	4248509147	4248509.147	6.13
Niger	ECOWAS	2004	286697.9	4252757656	4252757.656	6.74
Niger	ECOWAS	2005	308596.9	4444131751	4444131.751	6.94
Niger	ECOWAS	2006	288615.3	4701891392	4701891.392	6.14
Niger	ECOWAS	2007	293365.6	4849839715	4849839.715	6.05
Niger	ECOWAS	2008	436603.8	5314826498	5314826.498	8.21
Niger	ECOWAS	2009	415328.4	5276949262	5276949.262	7.87
Niger	ECOWAS	2010	329459.3	5718589799	5718589.799	5.76
Niger	ECOWAS	2011	383739.2	5850769296	5850769.296	6.56
Niger	ECOWAS	2012	686973.5	6541959480	6541959.48	10.50
Niger	ECOWAS	2013	805579.4	6886614682	6886614.682	11.70
Niger	ECOWAS	2014	697318.9	7372107103	7372107.103	9.46
Niger	ECOWAS	2015	520766.2	7637893798	7637893.798	6.82

			X+M		convert to 1000s US$	

Country	Region	Year	TTL trade	GDP (constant 2010 US$)	GDP (constant 2010 US$)	Regional trade % of GDP
Nigeria	ECOWAS	1996	757171.6	1.40933E+11	140933005.9	0.54
Nigeria	ECOWAS	1997	860807.1	1.44882E+11	144882310.1	0.59
Nigeria	ECOWAS	1998	582225.3	1.48817E+11	148816792.3	0.39
Nigeria	ECOWAS	1999	1066926	1.49523E+11	149522537.5	0.71
Nigeria	ECOWAS	2000	1452961	1.57474E+11	157474285.6	0.92
Nigeria	ECOWAS	2001	1169182	1.64421E+11	164420579	0.71
Nigeria	ECOWAS	2002	1298818	1.70643E+11	170643319.5	0.76
Nigeria	ECOWAS	2003	1454925	1.88312E+11	188312043.7	0.77
Nigeria	ECOWAS	2004	2299142	2.51841E+11	251840571.2	0.91
Nigeria	ECOWAS	2005	3143359	2.60516E+11	260515639.8	1.21
Nigeria	ECOWAS	2006	3987576	2.81906E+11	281906487.4	1.41
Nigeria	ECOWAS	2007	3034261	3.01156E+11	301156185.3	1.01
Nigeria	ECOWAS	2008	6858565	3.20039E+11	320039472.3	2.14
Nigeria	ECOWAS	2009	2222862	3.42232E+11	342232340.7	0.65
Nigeria	ECOWAS	2010	2227661	3.69062E+11	369062464.6	0.60
Nigeria	ECOWAS	2011	4318927	3.871E+11	387099974.1	1.12
Nigeria	ECOWAS	2012	5696885	4.03665E+11	403665055.4	1.41
Nigeria	ECOWAS	2013	7036824	4.2544E+11	425440429	1.65
Nigeria	ECOWAS	2014	5501675	4.52285E+11	452284521.4	1.22
Nigeria	ECOWAS	2015	3966527	4.64282E+11	464282244.1	0.85
Senegal	ECOWAS	1996	318948.7	7225946450	7225946.45	4.41
Senegal	ECOWAS	1997	320579.4	7451687424	7451687.424	4.30
Senegal	ECOWAS	1998	267042.7	7891238062	7891238.062	3.38
Senegal	ECOWAS	1999	304207.8	8393108414	8393108.414	3.62
Senegal	ECOWAS	2000	491101.9	8660566489	8660566.489	5.67
Senegal	ECOWAS	2001	398960	9057299801	9057299.801	4.40
Senegal	ECOWAS	2002	607814.1	9116607334	9116607.334	6.67
Senegal	ECOWAS	2003	772383.1	9725891001	9725891.001	7.94
Senegal	ECOWAS	2004	913723.9	10296875907	10296875.91	8.87

Senegal	ECOWAS	2005	1060470	10875828758	10875828.76	9.75
Senegal	ECOWAS	2006	542678.9	11143544923	11143544.92	4.87
Senegal	ECOWAS	2007	1287073	11693867227	11693867.23	11.01
Senegal	ECOWAS	2008	1959087	12124496741	12124496.74	16.16
Senegal	ECOWAS	2009	1425816	12418294627	12418294.63	11.48
Senegal	ECOWAS	2010	1556466	12937300245	12937300.25	12.03
Senegal	ECOWAS	2011	1726175	13165141375	13165141.37	13.11
Senegal	ECOWAS	2012	1958280	13745879495	13745879.5	14.25
Senegal	ECOWAS	2013	1923412	14224953272	14224953.27	13.52
Senegal	ECOWAS	2014	1814389	14838198265	14838198.27	12.23
Senegal	ECOWAS	2015	1592653	15800484321	15800484.32	10.08
Senegal	ECOWAS	2016	1602551	16851141949	16851141.95	9.51

			X+M		convert to 1000s US$	
Country	Region	Year	TTL trade	GDP (constant 2010 US$)	GDP (constant 2010 US$)	Regional trade % of GDP
Sierra Leone	ECOWAS	1996	0	1384449201	1384449.201	0.00
Sierra Leone	ECOWAS	1997	0	1303083986	1303083.986	0.00
Sierra Leone	ECOWAS	1998	0	1326344221	1326344.221	0.00
Sierra Leone	ECOWAS	1999	0	1300092081	1300092.081	0.00
Sierra Leone	ECOWAS	2000	39079.02	1386583669	1386583.669	2.82
Sierra Leone	ECOWAS	2001	0	1287577162	1287577.162	0.00
Sierra Leone	ECOWAS	2002	141047	1625805355	1625805.355	8.68
Sierra Leone	ECOWAS	2003	0	1778344672	1778344.672	0.00
Sierra Leone	ECOWAS	2004	0	1892470594	1892470.594	0.00
Sierra Leone	ECOWAS	2005	0	1974461587	1974461.587	0.00
Sierra Leone	ECOWAS	2006	0	2083567040	2083567.04	0.00
Sierra Leone	ECOWAS	2007	0	2251467572	2251467.572	0.00
Sierra Leone	ECOWAS	2008	0	2373039542	2373039.542	0.00
Sierra Leone	ECOWAS	2009	0	2483374322	2483374.322	0.00
Sierra Leone	ECOWAS	2010	0	2616610911	2616610.911	0.00
Sierra Leone	ECOWAS	2011	0	2742474775	2742474.775	0.00

Sierra Leone	ECOWAS	2012	0	3158830962	3158830.962	0.00
Sierra Leone	ECOWAS	2013	0	3813207065	3813207.065	0.00
Sierra Leone	ECOWAS	2014	844423.4	3986966231	3986966.231	21.18
Sierra Leone	ECOWAS	2015	502894.7	3170003041	3170003.041	15.86
Sierra Leone	ECOWAS	2016	250506.1	3362327554	3362327.554	7.45
Togo	ECOWAS	1996	173036.2	2255767596	2255767.596	7.67
Togo	ECOWAS	1997	148455.3	2580087820	2580087.82	5.75
Togo	ECOWAS	1998	148171.2	2520748985	2520748.985	5.88
Togo	ECOWAS	1999	211087.2	2583307709	2583307.709	8.17
Togo	ECOWAS	2000	125086.7	2563068020	2563068.02	4.88
Togo	ECOWAS	2001	171564.5	2521371869	2521371.869	6.80
Togo	ECOWAS	2002	192803	2498121012	2498121.012	7.72
Togo	ECOWAS	2003	307419.6	2621887861	2621887.861	11.73
Togo	ECOWAS	2004	314599.3	2677447378	2677447.378	11.75
Togo	ECOWAS	2005	314046	2709052153	2709052.153	11.59
Togo	ECOWAS	2006	80409.65	2818834122	2818834.122	2.85
Togo	ECOWAS	2007	307723.4	2883398218	2883398.218	10.67
Togo	ECOWAS	2008	435179.5	2947567675	2947567.675	14.76
Togo	ECOWAS	2009	500547	3051036045	3051036.045	16.41
Togo	ECOWAS	2010	274599.3	3172945645	3172945.645	8.65
Togo	ECOWAS	2011	635664.3	3327904820	3327904.82	19.10
Togo	ECOWAS	2012	660409.7	3488321264	3488321.264	18.93
Togo	ECOWAS	2013	693794.8	3626730618	3626730.618	19.13
Togo	ECOWAS	2014	558250.8	3839682315	3839682.315	14.54
Togo	ECOWAS	2015	545143.1	4045715351	4045715.351	13.47

Source: The Trade Data comes from the World Integrated Trade Solution (WITS). The GDP (constant 2010 US$) comes from the World Development Indicators. Note: TTL trade is total trade of each country {(exports (X) + Imports (M)} to ECOWAS only (see Appendix 5A). This Data has been used in chapter four table 4.8 and in chapter five econometric analysis.

Appendix A8: Human Development Index

Benin	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Income Index	0.38	0.39	0.39	0.39	0.39	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.41	0.41	0.41	0.41	0.41	0.41	0.42	0.42
Life Expectancy Index	0.55	0.55	0.55	0.55	0.55	0.56	0.56	0.57	0.58	0.58	0.59	0.6	0.6	0.61	0.61	0.61	0.62	0.62	0.62	0.62
Education Index	0.25	0.26	0.27	0.27	0.28	0.3	0.31	0.33	0.34	0.35	0.36	0.37	0.38	0.39	0.4	0.41	0.42	0.42	0.43	0.43
HDI	0.37	0.38	0.38	0.39	0.4	0.41	0.41	0.42	0.43	0.43	0.44	0.45	0.45	0.46	0.46	0.47	0.47	0.48	0.48	0.48
Burkina Faso	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Income Index	0.31	0.32	0.32	0.33	0.33	0.33	0.34	0.34	0.34	0.35	0.36	0.36	0.36	0.36	0.37	0.38	0.38	0.38	0.38	0.38
Life Expectancy Index	0.46	0.47	0.47	0.47	0.48	0.48	0.49	0.5	0.52	0.53	0.54	0.55	0.56	0.57	0.58	0.59	0.6	0.6	0.61	0.61
Education Index	0.12	0.12	0.13	0.14	0.14	0.15	0.15	0.16	0.17	0.19	0.2	0.21	0.22	0.24	0.25	0.26	0.28	0.29	0.31	0.31
HDI	0.26	0.26	0.27	0.28	0.28	0.29	0.29	0.3	0.31	0.33	0.34	0.35	0.36	0.37	0.38	0.39	0.4	0.41	0.41	0.42
Cape Verde	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Income Index	0.46	0.47	0.48	0.49	0.51	0.51	0.51	0.52	0.53	0.54	0.55	0.56	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
Life Expectancy Index	0.76	0.76	0.77	0.78	0.78	0.79	0.79	0.8	0.8	0.81	0.82	0.82	0.82	0.83	0.83	0.83	0.83	0.83	0.84	0.84
Education Index	0.28	0.3	0.32	0.34	0.36	0.39	0.41	0.43	0.45	0.47	0.49	0.49	0.5	0.51	0.52	0.53	0.54	0.56	0.57	0.57
HDI	0.46	0.48	0.49	0.51	0.53	0.54	0.55	0.56	0.58	0.59	0.6	0.61	0.62	0.62	0.62	0.63	0.64	0.64	0.65	0.65
Cote d'Ivoire	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Income Index	0.48	0.48	0.48	0.48	0.47	0.47	0.47	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.45	0.46	0.47	0.48	0.49
Life Expectancy Index	0.45	0.44	0.43	0.42	0.42	0.42	0.42	0.42	0.43	0.44	0.44	0.45	0.46	0.47	0.47	0.48	0.49	0.49	0.5	0.5
Education Index	0.27	0.28	0.29	0.3	0.3	0.31	0.31	0.32	0.32	0.32	0.33	0.33	0.33	0.33	0.34	0.34	0.34	0.35	0.35	0.35
HDI	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.4	0.4	0.4	0.41	0.41	0.42	0.42	0.42	0.43	0.43	0.44	0.44
Gambia	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015

Income Index	0.37	0.38	0.38	0.38	0.38	0.39	0.38	0.38	0.39	0.38	0.38	0.38	0.38	0.39	0.39	0.38	0.39	0.39	0.38	0.39
Life Expectancy Index	0.53	0.54	0.54	0.55	0.56	0.57	0.57	0.58	0.59	0.6	0.6	0.61	0.61	0.61	0.62	0.62	0.63	0.63	0.63	0.64
Education Index	0.21	0.22	0.22	0.23	0.24	0.25	0.26	0.27	0.28	0.29	0.3	0.31	0.32	0.33	0.34	0.35	0.36	0.37	0.38	0.38
HDI	0.35	0.35	0.36	0.36	0.37	0.38	0.38	0.39	0.4	0.4	0.41	0.41	0.42	0.43	0.44	0.44	0.44	0.45	0.45	0.45
Ghana	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Income Index	0.43	0.43	0.43	0.43	0.44	0.44	0.44	0.44	0.45	0.45	0.46	0.46	0.47	0.47	0.48	0.49	0.5	0.51	0.51	0.51
Life Expectancy Index	0.59	0.58	0.58	0.58	0.58	0.58	0.59	0.59	0.6	0.61	0.62	0.62	0.63	0.63	0.64	0.64	0.64	0.65	0.65	0.65
Education Index	0.45	0.45	0.46	0.46	0.48	0.47	0.48	0.48	0.5	0.52	0.54	0.57	0.59	0.6	0.61	0.62	0.64	0.65	0.67	0.67
HDI	0.48	0.48	0.49	0.49	0.49	0.49	0.5	0.5	0.51	0.52	0.53	0.55	0.56	0.56	0.57	0.58	0.59	0.6	0.6	0.61
Guinea	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Income Index	0.33	0.33	0.34	0.34	0.34	0.34	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Life Expectancy Index	0.5	0.5	0.49	0.49	0.49	0.49	0.49	0.5	0.5	0.51	0.52	0.53	0.55	0.56	0.57	0.58	0.59	0.6	0.61	0.62
Education Index	0.17	0.18	0.19	0.2	0.21	0.22	0.24	0.25	0.27	0.28	0.3	0.31	0.32	0.33	0.34	0.35	0.36	0.37	0.39	0.39
HDI	0.3	0.31	0.32	0.32	0.33	0.34	0.34	0.35	0.36	0.37	0.38	0.39	0.39	0.4	0.41	0.41	0.42	0.43	0.43	0.44
Guinea-Bissau	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Income Index	0.4	0.41	0.36	0.36	0.37	0.37	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.37	0.37	0.38	0.37	0.37	0.37	0.37
Life Expectancy Index	0.48	0.49	0.49	0.49	0.49	0.5	0.5	0.5	0.51	0.51	0.51	0.52	0.52	0.53	0.53	0.54	0.54	0.55	0.55	0.56
Education Index	0.21	0.22	0.23	0.24	0.25	0.26	0.27	0.28	0.3	0.31	0.32	0.34	0.35	0.37	0.38	0.4	0.41	0.43	0.44	0.44
HDI	0.34	0.35	0.34	0.35	0.35	0.36	0.37	0.37	0.38	0.38	0.39	0.4	0.41	0.41	0.42	0.43	0.44	0.44	0.45	0.45
Liberia	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Income Index	0.13	0.23	0.25	0.27	0.3	0.3	0.3	0.25	0.25	0.25	0.26	0.26	0.27	0.27	0.27	0.28	0.29	0.29	0.29	0.29

Life Expectancy Index	0.49	0.5	0.5	0.51	0.51	0.51	0.52	0.52	0.54	0.55	0.57	0.58	0.6	0.61	0.62	0.63	0.63	0.64	0.64	0.65
Education Index	0.33	0.34	0.35	0.36	0.4	0.41	0.42	0.42	0.43	0.44	0.45	0.45	0.46	0.47	0.48	0.48	0.49	0.5	0.51	0.51
HDI	0.28	0.34	0.35	0.37	0.39	0.4	0.4	0.38	0.39	0.39	0.4	0.41	0.42	0.43	0.43	0.44	0.45	0.45	0.46	0.46
Mali	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Income Index	0.37	0.37	0.38	0.38	0.38	0.39	0.39	0.4	0.4	0.4	0.4	0.4	0.4	0.41	0.41	0.41	0.4	0.4	0.41	0.41
Life Expectancy Index	0.44	0.44	0.44	0.45	0.45	0.46	0.47	0.49	0.5	0.51	0.53	0.54	0.55	0.56	0.57	0.58	0.58	0.59	0.6	0.6
Education Index	0.13	0.14	0.15	0.16	0.17	0.18	0.18	0.19	0.2	0.21	0.22	0.23	0.24	0.24	0.25	0.26	0.27	0.28	0.29	0.29
HDI	0.28	0.28	0.29	0.3	0.31	0.32	0.32	0.33	0.34	0.35	0.36	0.37	0.37	0.38	0.39	0.39	0.4	0.4	0.41	0.41
Niger	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Income Index	0.29	0.29	0.3	0.29	0.28	0.29	0.29	0.29	0.28	0.28	0.29	0.29	0.29	0.29	0.29	0.29	0.3	0.3	0.31	0.31
Life Expectancy Index	0.44	0.45	0.46	0.47	0.48	0.49	0.5	0.51	0.52	0.53	0.54	0.56	0.57	0.59	0.6	0.62	0.63	0.64	0.65	0.66
Education Index	0.09	0.1	0.1	0.11	0.11	0.12	0.12	0.13	0.14	0.15	0.16	0.17	0.17	0.18	0.19	0.21	0.22	0.23	0.24	0.24
HDI	0.23	0.23	0.24	0.24	0.25	0.26	0.26	0.27	0.27	0.28	0.29	0.3	0.31	0.31	0.32	0.33	0.35	0.35	0.36	0.37
Nigeria	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Income Index	0.47	0.47	0.47	0.46	0.47	0.47	0.47	0.48	0.52	0.52	0.53	0.53	0.54	0.54	0.55	0.55	0.56	0.56	0.56	0.56
Life Expectancy Index	0.41	0.41	0.41	0.42	0.42	0.42	0.43	0.43	0.44	0.45	0.46	0.47	0.48	0.49	0.49	0.5	0.5	0.51	0.52	0.52
Education Index	0.35	0.36	0.37	0.39	0.4	0.41	0.43	0.44	0.45	0.46	0.47	0.48	0.49	0.5	0.51	0.52	0.53	0.53	0.54	0.54
HDI	0.41	0.41	0.42	0.42	0.43	0.43	0.44	0.45	0.47	0.48	0.49	0.49	0.5	0.51	0.52	0.52	0.53	0.53	0.54	0.54
Senegal	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Income Index	0.4	0.4	0.41	0.41	0.41	0.42	0.41	0.42	0.42	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.44
Life Expectancy Index	0.59	0.59	0.59	0.59	0.59	0.6	0.61	0.62	0.62	0.63	0.65	0.66	0.67	0.68	0.69	0.7	0.71	0.72	0.73	0.74

Education Index	0.21	0.21	0.21	0.21	0.22	0.22	0.22	0.22	0.22	0.22	0.23	0.25	0.27	0.28	0.29	0.31	0.32	0.34	0.35	0.35
HDI	0.37	0.37	0.37	0.37	0.38	0.38	0.38	0.38	0.39	0.39	0.4	0.41	0.42	0.43	0.44	0.45	0.46	0.47	0.48	0.48
Sierra Leone	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Income Index	0.32	0.31	0.31	0.3	0.31	0.29	0.32	0.33	0.33	0.33	0.33	0.34	0.34	0.35	0.35	0.35	0.37	0.39	0.4	0.36
Life Expectancy Index	0.25	0.26	0.27	0.28	0.29	0.31	0.32	0.34	0.36	0.37	0.39	0.4	0.42	0.43	0.44	0.46	0.47	0.48	0.49	0.49
Education Index	0.23	0.24	0.25	0.26	0.27	0.28	0.29	0.3	0.31	0.32	0.33	0.34	0.35	0.36	0.36	0.37	0.38	0.39	0.4	0.4
HDI	0.26	0.27	0.28	0.28	0.29	0.29	0.31	0.32	0.33	0.34	0.35	0.36	0.37	0.38	0.38	0.39	0.4	0.42	0.43	0.42
Togo	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Income Index	0.36	0.37	0.36	0.36	0.36	0.35	0.34	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.36	0.36	0.36
Life Expectancy Index	0.54	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.54	0.54	0.55	0.56	0.57	0.58	0.59	0.6	0.61	0.62	0.62	0.63
Education Index	0.36	0.37	0.38	0.39	0.4	0.41	0.42	0.43	0.43	0.44	0.46	0.45	0.47	0.49	0.51	0.53	0.55	0.57	0.59	0.59
HDI	0.41	0.42	0.42	0.42	0.42	0.42	0.42	0.43	0.43	0.44	0.44	0.44	0.45	0.46	0.47	0.48	0.49	0.5	0.51	0.51

Appendix 4A: Total ECOWAS Trade with selected partners and the Rest of the World

Appendix 4A.0: Total ECOWAS exports to the World by product and to selected trade partners and share

		ECOWAS exports by destination					export share (%) by destination			
Year	Product category	Total to the World	To ECOWAS	To EU27	To OECD	To China	ECOWAS	EU27	OECD	China
1996	Food and live animals	3465311.6	208976.1	2596013.5	2891995.9	1463.2	6.0	74.9	83.5	0.0
1997	Food and live animals	3159938.1	180466.5	2344653.2	2543118.3	8051.5	5.7	74.2	80.5	0.3
1998	Food and live animals	3352998.8	199520.0	2368854.7	2747505.5	13562.2	6.0	70.6	81.9	0.4
1999	Food and live animals	3165475.9	235840.9	2158758.4	2588974.6	2429.3	7.5	68.2	81.8	0.1
2000	Food and live animals	2716075.2	256913.2	1778733.7	2127006.2	16310.1	9.5	65.5	78.3	0.6
2001	Food and live animals	2852753.6	321777.7	1881186.1	2202472.6	14369.4	11.3	65.9	77.2	0.5
2002	Food and live animals	3272525.6	405548.1	2132368.3	2497790.5	6566.2	12.4	65.2	76.3	0.2
2003	Food and live animals	4508580.3	399610.5	3116743.4	3617076.0	22510.1	8.9	69.1	80.2	0.5
2004	Food and live animals	3692912.3	432118.4	2111800.2	2669711.1	8518.8	11.7	57.2	72.3	0.2
2005	Food and live animals	4487203.6	472556.7	2546407.5	3332963.6	35370.4	10.5	56.7	74.3	0.8
2006	Food and live animals	4865350.7	366435.2	2992887.6	3774184.5	39775.9	7.5	61.5	77.6	0.8
2007	Food and live animals	5813222.3	547387.0	3514298.3	4289165.4	58637.1	9.4	60.5	73.8	1.0
2008	Food and live animals	6959721.0	779646.4	3773099.0	4635603.9	87946.5	11.2	54.2	66.6	1.3
2009	Food and live animals	8744025.2	796795.2	4402685.6	5597870.2	49391.8	9.1	50.4	64.0	0.6
2010	Food and live animals	8848697.6	816265.3	4395912.6	5660368.2	41041.7	9.2	49.7	64.0	0.5
2011	Food and live animals	11219384.1	1201017.5	5250298.9	7104306.4	115882.0	10.7	46.8	63.3	1.0
2012	Food and live animals	14787403.2	1168878.3	6676235.7	9347914.4	193933.9	7.9	45.1	63.2	1.3
2013	Food and live animals	10731061.9	1126295.7	5804590.6	7188978.8	111913.8	10.5	54.1	67.0	1.0
2014	Food and live animals	8533932.9	843424.5	4359525.5	5767321.7	60909.6	9.9	51.1	67.6	0.7
2015	Food and live animals	7604027.5	722365.1	4088495.6	5444417.5	37907.1	9.5	53.8	71.6	0.5

		ECOWAS exports by destination					export share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Beverages and tobacco	19655.4	10629.3	6346.3	5888.7		54.1	32.3	30.0	0.0
1997	Beverages and tobacco	11378.6	6582.8	1781.0	2345.8		57.9	15.7	20.6	0.0
1998	Beverages and tobacco	17386.1	10384.5	1877.4	2044.8		59.7	10.8	11.8	0.0
1999	Beverages and tobacco	23691.4	14141.0	2106.3	2371.8		59.7	8.9	10.0	0.0
2000	Beverages and tobacco	44929.8	29249.0	3713.3	10681.1		65.1	8.3	23.8	0.0
2001	Beverages and tobacco	77559.4	40611.3	10712.8	33505.5		52.4	13.8	43.2	0.0
2002	Beverages and tobacco	49900.3	37630.4	2718.3	10350.6	29.4	75.4	5.4	20.7	0.1

2003	Beverages and tobacco	97115.5	78563.2	1788.7	5567.2	30.8	80.9	1.8	5.7	0.0
2004	Beverages and tobacco	98584.9	82124.2	2473.0	5917.3	137.3	83.3	2.5	6.0	0.1
2005	Beverages and tobacco	121354.1	87356.3	16384.6	22339.3	735.6	72.0	13.5	18.4	0.6
2006	Beverages and tobacco	87926.9	75287.2	4170.8	5927.1	246.9	85.6	4.7	6.7	0.3
2007	Beverages and tobacco	207447.4	151358.1	17750.9	19526.1	626.5	73.0	8.6	9.4	0.3
2008	Beverages and tobacco	268165.1	163896.6	21065.3	22242.8	554.9	61.1	7.9	8.3	0.2
2009	Beverages and tobacco	312884.0	156407.3	25660.4	36154.3	1702.2	50.0	8.2	11.6	0.5
2010	Beverages and tobacco	424174.2	161668.6	70090.5	89191.7	1613.4	38.1	16.5	21.0	0.4
2011	Beverages and tobacco	455175.1	264696.8	77033.7	82773.1	1491.3	58.2	16.9	18.2	0.3
2012	Beverages and tobacco	515289.1	367403.3	43136.8	55881.6	8333.4	71.3	8.4	10.8	1.6
2013	Beverages and tobacco	518228.2	389275.1	22986.5	24575.7		75.1	4.4	4.7	0.0
2014	Beverages and tobacco	427081.8	290667.4	13066.8	13486.2	29.2	68.1	3.1	3.2	0.0
2015	Beverages and tobacco	210055.0	147643.3	2380.4	2886.7	11.7	70.3	1.1	1.4	0.0

		ECOWAS exports by destination					export share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Crude materials, inedible except fuels; mineral fuel	2518285.9	537696.0	1050434.5	1272179.3	35586.3	21.4	41.7	50.5	1.4
1997	Crude materials, inedible except fuels; mineral fuel	2006653.5	405058.1	793699.9	1029601.7	21428.0	20.2	39.6	51.3	1.1
1998	Crude materials, inedible except fuels; mineral fuel	2037956.5	383195.1	790085.9	1050914.4	13224.4	18.8	38.8	51.6	0.6
1999	Crude materials, inedible except fuels; mineral fuel	1807242.5	332351.0	796277.5	984661.0	7789.5	18.4	44.1	54.5	0.4
2000	Crude materials, inedible except fuels; mineral fuel	1660032.0	270589.1	717481.1	929256.9	10635.9	16.3	43.2	56.0	0.6
2001	Crude materials, inedible except fuels; mineral fuel	1479941.8	50881.2	704875.3	964005.0	11480.0	3.4	47.6	65.1	0.8
2002	Crude materials, inedible except fuels; mineral fuel	1427846.7	112848.2	666091.6	842692.0	25269.3	7.9	46.7	59.0	1.8
2003	Crude materials, inedible except fuels; mineral fuel	1820818.4	308290.2	634178.6	780846.4	170260.6	16.9	34.8	42.9	9.4
2004	Crude materials, inedible except fuels; mineral fuel	2360399.5	371513.4	949092.6	1148578.0	212789.3	15.7	40.2	48.7	9.0
2005	Crude materials, inedible except fuels; mineral fuel	2438892.1	299623.4	1075182.3	1284814.6	266793.5	12.3	44.1	52.7	10.9
2006	Crude materials, inedible except fuels; mineral fuel	2146349.0	59234.4	975407.3	1161569.4	216250.2	2.8	45.4	54.1	10.1
2007	Crude materials, inedible except fuels; mineral fuel	3579991.8	194499.6	1893048.3	2420938.2	163632.3	5.4	52.9	67.6	4.6
2008	Crude materials, inedible except fuels; mineral fuel	4200843.5	167168.8	2015178.4	2620617.5	198082.3	4.0	48.0	62.4	4.7
2009	Crude materials, inedible except fuels; mineral fuel	2609207.6	103019.4	1051531.8	1366217.5	185999.3	3.9	40.3	52.4	7.1
2010	Crude materials, inedible except fuels; mineral fuel	4893267.8	136955.7	1396544.2	2490184.8	349486.3	2.8	28.5	50.9	7.1
2011	Crude materials, inedible except fuels; mineral fuel	12163753.9	327178.6	6813746.9	8563506.5	881735.8	2.7	56.0	70.4	7.2
2012	Crude materials, inedible except fuels; mineral fuel	13978267.4	200331.7	6567683.0	7061637.4	1730358.3	1.4	47.0	50.5	12.4
2013	Crude materials, inedible except fuels; mineral fuel	8110633.1	188280.7	3528685.4	4709907.5	732120.5	2.3	43.5	58.1	9.0
2014	Crude materials, inedible except fuels; mineral fuel	4897460.7	182323.7	1617185.9	2516580.5	615934.8	3.7	33.0	51.4	12.6
2015	Crude materials, inedible except fuels; mineral fuel	3163546.7	125789.9	1215075.4	1724503.1	224658.5	4.0	38.4	54.5	7.1

		ECOWAS exports by destination					export share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Mineral fuels - petroleum, gas, coal	11636679.6	956019.1	4461173.9	9525306.2	407.1	8.2	38.3	81.9	0.0
1997	Mineral fuels - petroleum, gas, coal	11443047.8	1134651.8	3043931.3	8672410.7	101.6	9.9	26.6	75.8	0.0
1998	Mineral fuels - petroleum, gas, coal	7230226.8	845511.0	1979205.6	5249467.9	31620.1	11.7	27.4	72.6	0.4
1999	Mineral fuels - petroleum, gas, coal	16638354.2	1405261.4	3502779.7	9991375.9	187771.1	8.4	21.1	60.1	1.1
2000	Mineral fuels - petroleum, gas, coal	27907808.9	1871796.6	6246330.9	19051686.5	140337.4	6.7	22.4	68.3	0.5
2001	Mineral fuels - petroleum, gas, coal	18807535.5	1209964.5	4424373.5	12529972.8	127129.9	6.4	23.5	66.6	0.7
2002	Mineral fuels - petroleum, gas, coal	18076209.5	1017203.7	3925007.9	10813696.2	72043.0	5.6	21.7	59.8	0.4
2003	Mineral fuels - petroleum, gas, coal	24311016.6	1393771.7	5193732.8	16234358.3	109949.2	5.7	21.4	66.8	0.5
2004	Mineral fuels - petroleum, gas, coal	1490389.5	822748.1	117303.0	346439.5	72.2	55.2	7.9	23.2	0.0
2005	Mineral fuels - petroleum, gas, coal	2414672.0	1281040.5	327564.3	755135.0	217.8	53.1	13.6	31.3	0.0
2006	Mineral fuels - petroleum, gas, coal	61214648.1	4824626.1	13331163.1	45635930.2	57787.6	7.9	21.8	74.6	0.1
2007	Mineral fuels - petroleum, gas, coal	53538728.8	3428546.7	8898914.6	36110436.3	735351.2	6.4	16.6	67.4	1.4
2008	Mineral fuels - petroleum, gas, coal	79580392.4	5965556.1	16817558.2	53964622.0	147692.5	7.5	21.1	67.8	0.2
2009	Mineral fuels - petroleum, gas, coal	48680678.1	3759640.7	10886004.9	26524626.9	545480.0	7.7	22.4	54.5	1.1
2010	Mineral fuels - petroleum, gas, coal	78312366.0	3136928.1	17010396.8	49322623.1	626340.2	4.0	21.7	63.0	0.8
2011	Mineral fuels - petroleum, gas, coal	122394664.8	8766551.4	31914501.3	67197703.0	1251366.7	7.2	26.1	54.9	1.0
2012	Mineral fuels - petroleum, gas, coal	128706229.7	7289446.5	44077583.8	73432791.1	6840714.8	5.7	34.2	57.1	5.3
2013	Mineral fuels - petroleum, gas, coal	86323908.0	5667610.0	36069829.8	48321388.6	1069980.2	6.6	41.8	56.0	1.2
2014	Mineral fuels - petroleum, gas, coal	97003499.6	6372098.0	36974653.6	48149025.5	1510627.4	6.6	38.1	49.6	1.6
2015	Mineral fuels - petroleum, gas, coal	1882086.6	909021.0	536727.4	555276.0	3.7	48.3	28.5	29.5	0.0

		ECOWAS exports by destination					export share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Animals and vegetable oils and fats	114052.9	27192.7	83331.2	86311.1		23.8	73.1	75.7	0.0
1997	Animals and vegetable oils and fats	85204.6	42917.3	39541.3	38375.1		50.4	46.4	45.0	0.0
1998	Animals and vegetable oils and fats	165263.6	46081.5	113960.5	101326.8		27.9	69.0	61.3	0.0
1999	Animals and vegetable oils and fats	128597.1	56000.9	70774.0	70908.3		43.5	55.0	55.1	0.0
2000	Animals and vegetable oils and fats	129705.0	40333.1	84132.5	87712.7		31.1	64.9	67.6	0.0
2001	Animals and vegetable oils and fats	135340.2	47671.4	81857.3	87011.5	104.0	35.2	60.5	64.3	0.1
2002	Animals and vegetable oils and fats	76174.9	45760.1	64702.9	69053.4		60.1	84.9	90.7	0.0
2003	Animals and vegetable oils and fats	122356.4	79223.2	39673.2	41218.9		64.7	32.4	33.7	0.0
2004	Animals and vegetable oils and fats	134121.1	88705.6	41403.7	43986.5		66.1	30.9	32.8	0.0
2005	Animals and vegetable oils and fats	143960.1	83164.7	42806.1	58687.2	6.4	57.8	29.7	40.8	0.0

2006	Animals and vegetable oils and fats	118902.5	86107.2	18237.4	25966.3	349.0	72.4	15.3	21.8	0.3
2007	Animals and vegetable oils and fats	213524.2	109357.5	57163.1	99478.5	41.2	51.2	26.8	46.6	0.0
2008	Animals and vegetable oils and fats	245565.6	153726.5	81485.0	82214.6	104.8	62.6	33.2	33.5	0.0
2009	Animals and vegetable oils and fats	245052.4	121654.7	83969.9	85839.9	13510.7	49.6	34.3	35.0	5.5
2010	Animals and vegetable oils and fats	300168.5	134606.7	95870.2	111024.4	281.9	44.8	31.9	37.0	0.1
2011	Animals and vegetable oils and fats	498263.2	288211.0	124131.8	136865.5	352.8	57.8	24.9	27.5	0.1
2012	Animals and vegetable oils and fats	548177.3	347171.2	163676.8	168853.4	636.1	63.3	29.9	30.8	0.1
2013	Animals and vegetable oils and fats	558282.9	296177.6	206799.8	216077.6	1938.7	53.1	37.0	38.7	0.3
2014	Animals and vegetable oils and fats	363612.6	246307.1	57683.4	67461.7	20316.4	67.7	15.9	18.6	5.6
2015	Animals and vegetable oils and fats	361399.0	228779.1	72427.6	76576.7	27102.5	63.3	20.0	21.2	7.5

		ECOWAS exports by destination					export share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Chemicals	340172.4	112793.0	32150.6	47126.3	30.0	33.2	9.5	13.9	0.0
1997	Chemicals	400085.7	227039.7	24957.8	40368.8	14.0	56.7	6.2	10.1	0.0
1998	Chemicals	547527.9	272414.4	41226.0	46483.9	0.0	49.8	7.5	8.5	0.0
1999	Chemicals	480419.6	265123.8	53550.5	59961.1	6.8	55.2	11.1	12.5	0.0
2000	Chemicals	350687.4	185279.3	22606.3	22416.1	240.0	52.8	6.4	6.4	0.1
2001	Chemicals	452082.8	229673.5	51298.2	52305.9	278.5	50.8	11.3	11.6	0.1
2002	Chemicals	607565.6	298577.9	31392.0	46985.4	9835.8	49.1	5.2	7.7	1.6
2003	Chemicals	521689.0	306822.0	15726.8	19012.0	408.7	58.8	3.0	3.6	0.1
2004	Chemicals	743430.6	391144.2	17417.6	19434.7	79.0	52.6	2.3	2.6	0.0
2005	Chemicals	667171.0	356620.8	15924.0	54896.0	226.1	53.5	2.4	8.2	0.0
2006	Chemicals	548757.4	392310.8	14253.8	41271.6	1502.6	71.5	2.6	7.5	0.3
2007	Chemicals	863945.0	478488.2	74902.3	132814.5	13028.0	55.4	8.7	15.4	1.5
2008	Chemicals	2185078.5	1074512.9	372225.9	474178.8	28578.9	49.2	17.0	21.7	1.3
2009	Chemicals	1119546.3	575411.3	120303.3	160392.7	19271.8	51.4	10.7	14.3	1.7
2010	Chemicals	1379167.4	509778.1	33082.2	134723.7	37914.7	37.0	2.4	9.8	2.7
2011	Chemicals	1654918.1	906017.3	83518.6	194883.1	24513.8	54.7	5.0	11.8	1.5
2012	Chemicals	1530738.6	867727.8	46887.1	112244.5	104126.6	56.7	3.1	7.3	6.8
2013	Chemicals	1508306.4	965216.5	99419.5	121926.8	47033.9	64.0	6.6	8.1	3.1
2014	Chemicals	917895.3	621631.1	76316.3	83975.0	6377.8	67.7	8.3	9.1	0.7
2015	Chemicals	585733.6	352600.0	20668.2	33219.1	712.0	60.2	3.5	5.7	0.1

		ECOWAS exports by destination					export share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Manufactured goods	531273.6	77462.4	348042.3	365292.2	311.3	14.6	65.5	68.8	0.1
1997	Manufactured goods	650743.6	210591.8	340688.4	332067.0	208.6	32.4	52.4	51.0	0.0
1998	Manufactured goods	554025.4	209165.7	251293.9	268448.0	55.0	37.8	45.4	48.5	0.0
1999	Manufactured goods	688252.1	282502.8	236990.0	260901.0	407.3	41.0	34.4	37.9	0.1
2000	Manufactured goods	634956.2	239212.1	272644.2	281388.6	17120.3	37.7	42.9	44.3	2.7
2001	Manufactured goods	699349.4	324609.6	269816.9	217596.2	12230.8	46.4	38.6	31.1	1.7
2002	Manufactured goods	624467.9	404490.4	134920.8	151285.3	585.4	64.8	21.6	24.2	0.1
2003	Manufactured goods	689456.5	373626.6	207391.2	238267.7	6894.6	54.2	30.1	34.6	1.0
2004	Manufactured goods	608592.9	380596.2	141371.3	147591.3	888.4	62.5	23.2	24.3	0.1
2005	Manufactured goods	1275374.5	791885.4	312726.4	367312.0	2799.7	62.1	24.5	28.8	0.2
2006	Manufactured goods	1099146.8	582446.6	301821.8	378622.1	4858.3	53.0	27.5	34.4	0.4
2007	Manufactured goods	1668052.7	639346.1	539031.9	641575.9	52359.5	38.3	32.3	38.5	3.1
2008	Manufactured goods	2332456.9	814014.8	653242.2	755915.6	53851.9	34.9	28.0	32.4	2.3
2009	Manufactured goods	2040990.3	906311.5	548961.7	646645.8	65085.3	44.4	26.9	31.7	3.2
2010	Manufactured goods	5139409.9	803073.0	1383299.4	1968836.0	602805.5	15.6	26.9	38.3	11.7
2011	Manufactured goods	3254761.7	1336920.0	1098523.2	1270582.2	110895.6	41.1	33.8	39.0	3.4
2012	Manufactured goods	3702720.3	1248702.4	1260752.8	1527959.8	252709.5	33.7	34.0	41.3	6.8
2013	Manufactured goods	3356094.9	1225888.4	877334.3	1136658.3	91027.3	36.5	26.1	33.9	2.7
2014	Manufactured goods	3003510.8	892062.6	1262212.6	1516726.7	37893.5	29.7	42.0	50.5	1.3
2015	Manufactured goods	852742.2	685474.2	82427.8	91231.6	4836.0	80.4	9.7	10.7	0.6

		ECOWAS exports by destination					export share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Machinery and transport equipment	96448.6	20643.2	32402.0	55936.0	2196.3	21.4	33.6	58.0	2.3
1997	Machinery and transport equipment	497469.1	46624.2	337580.8	371484.6	53.9	9.4	67.9	74.7	0.0
1998	Machinery and transport equipment	361094.5	150273.7	72134.1	126013.6	34.5	41.6	20.0	34.9	0.0
1999	Machinery and transport equipment	439896.4	46996.2	105789.6	191949.9	319.7	10.7	24.0	43.6	0.1
2000	Machinery and transport equipment	141932.6	43537.2	46608.6	79462.3	269.6	30.7	32.8	56.0	0.2
2001	Machinery and transport equipment	294180.2	58437.8	59017.8	96260.5	390.4	19.9	20.1	32.7	0.1
2002	Machinery and transport equipment	1097011.4	449188.0	593903.0	629480.7	1527.7	40.9	54.1	57.4	0.1
2003	Machinery and transport equipment	1123588.5	69576.1	642976.4	879051.3	8799.2	6.2	57.2	78.2	0.8
2004	Machinery and transport equipment	692376.4	78982.8	561496.9	579158.1	481.3	11.4	81.1	83.6	0.1
2005	Machinery and transport equipment	1080097.8	82509.7	483495.5	517739.5	9127.4	7.6	44.8	47.9	0.8

2006	Machinery and transport equipment	1193356.5	36090.0	449102.0	682839.9	2882.9	3.0	37.6	57.2	0.2
2007	Machinery and transport equipment	861283.3	116456.3	588079.4	632916.1	27226.0	13.5	68.3	73.5	3.2
2008	Machinery and transport equipment	2879448.6	1323813.7	552472.5	897232.4	9442.9	46.0	19.2	31.2	0.3
2009	Machinery and transport equipment	1483431.2	127920.3	793675.6	557588.7	35715.8	8.6	53.5	37.6	2.4
2010	Machinery and transport equipment	2150155.0	745627.9	567674.7	865366.7	35300.1	34.7	26.4	40.2	1.6
2011	Machinery and transport equipment	2065402.5	340010.5	365222.3	649959.8	697351.4	16.5	17.7	31.5	33.8
2012	Machinery and transport equipment	2596411.2	433070.9	1071123.8	1362880.8	56292.0	16.7	41.3	52.5	2.2
2013	Machinery and transport equipment	3341524.6	1901647.6	443715.0	638435.4	35466.7	56.9	13.3	19.1	1.1
2014	Machinery and transport equipment	4128456.4	379443.8	2302158.1	2444710.5	56251.1	9.2	55.8	59.2	1.4
2015	Machinery and transport equipment	637989.7	251099.8	166162.1	231577.3	16115.7	39.4	26.0	36.3	2.5

		ECOWAS exports by destination					export share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Miscellaneous- furniture and sanitary	66907.2	20512.7	31192.7	36189.2	5.4	30.7	46.6	54.1	0.0
1997	Miscellaneous- furniture and sanitary	142058.9	89277.0	28027.0	27009.4	0.0	62.8	19.7	19.0	0.0
1998	Miscellaneous- furniture and sanitary	202973.7	125267.6	36394.7	35720.8	36.1	61.7	17.9	17.6	0.0
1999	Miscellaneous- furniture and sanitary	191221.4	100214.7	34526.4	43228.4	1511.4	52.4	18.1	22.6	0.8
2000	Miscellaneous- furniture and sanitary	225177.6	112545.4	54090.2	83997.7	109.1	50.0	24.0	37.3	0.0
2001	Miscellaneous- furniture and sanitary	193958.7	106583.6	51822.5	62855.2	121.5	55.0	26.7	32.4	0.1
2002	Miscellaneous- furniture and sanitary	255186.7	201556.2	22337.7	27852.6	47.6	79.0	8.8	10.9	0.0
2003	Miscellaneous- furniture and sanitary	221892.1	131155.0	39939.6	53009.2	88.7	59.1	18.0	23.9	0.0
2004	Miscellaneous- furniture and sanitary	186061.3	110894.8	47283.6	51281.6	46.5	59.6	25.4	27.6	0.0
2005	Miscellaneous- furniture and sanitary	220351.6	148337.6	46050.6	52202.8	94.4	67.3	20.9	23.7	0.0
2006	Miscellaneous- furniture and sanitary	475199.8	303990.9	94067.4	115331.1	247.5	64.0	19.8	24.3	0.1
2007	Miscellaneous- furniture and sanitary	644141.7	241058.0	319178.5	346530.1	5832.6	37.4	49.6	53.8	0.9
2008	Miscellaneous- furniture and sanitary	679424.3	237861.3	230277.0	349440.5	1805.4	35.0	33.9	51.4	0.3
2009	Miscellaneous- furniture and sanitary	586670.0	326718.0	59032.5	80307.4	10769.9	55.7	10.1	13.7	1.8
2010	Miscellaneous- furniture and sanitary	985659.9	246904.4	26748.8	450127.2	14433.2	25.0	2.7	45.7	1.5
2011	Miscellaneous- furniture and sanitary	837538.1	544124.9	83192.3	112401.9	3980.6	65.0	9.9	13.4	0.5
2012	Miscellaneous- furniture and sanitary	738809.7	477481.1	45342.5	77972.4	9870.5	64.6	6.1	10.6	1.3
2013	Miscellaneous- furniture and sanitary	1106944.0	632345.7	117609.4	248036.1	35182.6	57.1	10.6	22.4	3.2
2014	Miscellaneous- furniture and sanitary	2605494.4	475858.2	1534646.5	1842483.3	6287.8	18.3	58.9	70.7	0.2
2015	Miscellaneous- furniture and sanitary	442295.9	241972.2	29736.4	56476.8	839.3	54.7	6.7	12.8	0.2

		ECOWAS exports by destination					export share (%) by destination			
Year	Product category	Total to the World (export only)	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Commodity -firearms, zoo animals, coin etc.	26820.8	8327.4	12325.0	14057.9	49.0	31.0	46.0	52.4	0.2
1997	Commodity -firearms, zoo animals, coin etc.	31806.1	9174.5	15873.5	18113.0	12.8	28.8	49.9	56.9	0.0
1998	Commodity -firearms, zoo animals, coin etc.	21952.2	5597.5	9969.1	11985.4		25.5	45.4	54.6	0.0
1999	Commodity -firearms, zoo animals, coin etc.	23611.2	8023.5	9564.0	13203.9	1.9	34.0	40.5	55.9	0.0
2000	Commodity -firearms, zoo animals, coin etc.	36817.9	8483.1	13537.5	16481.7	42.6	23.0	36.8	44.8	0.1
2001	Commodity -firearms, zoo animals, coin etc.	56709.6	8649.7	16099.5	18714.8	1.1	15.3	28.4	33.0	0.0
2002	Commodity -firearms, zoo animals, coin etc.	34758.7	10667.5	12535.1	14768.5	37.4	30.7	36.1	42.5	0.1
2003	Commodity -firearms, zoo animals, coin etc.	344730.7	150234.0	100709.5	109460.5	109.4	43.6	29.2	31.8	0.0
2004	Commodity -firearms, zoo animals, coin etc.	506803.6	12967.9	481217.5	482702.5	11.6	2.6	95.0	95.2	0.0
2005	Commodity -firearms, zoo animals, coin etc.	543754.6	13376.8	506777.7	509693.2	4.8	2.5	93.2	93.7	0.0
2006	Commodity -firearms, zoo animals, coin etc.	575588.3	9567.5	357026.8	358872.5		1.7	62.0	62.3	0.0
2007	Commodity -firearms, zoo animals, coin etc.	1054603.9	65367.5	438465.8	981355.1	1209.7	6.2	41.6	93.1	0.1
2008	Commodity -firearms, zoo animals, coin etc.	301365.7	22166.2	57944.7	59725.4	44.2	7.4	19.2	19.8	0.0
2009	Commodity -firearms, zoo animals, coin etc.	178590.0	22828.0	76248.1	78860.9	1846.3	12.8	42.7	44.2	1.0
2010	Commodity -firearms, zoo animals, coin etc.	149529.6	15007.3	46599.7	71429.4	12069.1	10.0	31.2	47.8	8.1
2011	Commodity -firearms, zoo animals, coin etc.	227448.7	24725.0	52869.1	158526.5	3956.6	10.9	23.2	69.7	1.7
2012	Commodity -firearms, zoo animals, coin etc.	838821.0	26367.3	490184.5	754743.2	33605.8	3.1	58.4	90.0	4.0
2013	Commodity -firearms, zoo animals, coin etc.	211644.3	46935.9	138215.7	150064.6	863.6	22.2	65.3	70.9	0.4
2014	Commodity -firearms, zoo animals, coin etc.	215236.4	14575.6	154489.1	182826.8	105.6	6.8	71.8	84.9	0.0
2015	Commodity -firearms, zoo animals, coin etc.	195034.4	30940.9	49254.0	54407.7	40304.6	15.9	25.3	27.9	20.7

Appendix 4A.1: Total ECOWAS imports to the World and from selected trade partners by product categories

		ECOWAS Imports by destination					Import share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Food and live animals	2828545	107137	1119357	1500362	48552	3.8	39.6	53.0	1.7
1997	Food and live animals	2970781	108406	1134066	1519761	49392	3.6	38.2	51.2	1.7
1998	Food and live animals	3212554	132682	1281741	1661061	102467	4.1	39.9	51.7	3.2
1999	Food and live animals	3126442	115395	1340879	1967405	88769	3.7	42.9	62.9	2.8
2000	Food and live animals	2751492	135970	1294014	1718539	139031	4.9	47.0	62.5	5.1
2001	Food and live animals	3619514	253372	1561981	2145578	196703	7.0	43.2	59.3	5.4
2002	Food and live animals	3902405	242010	1544170	2213337	217595	6.2	39.6	56.7	5.6
2003	Food and live animals	4610217	244719	1811618	2772382	181257	5.3	39.3	60.1	3.9
2004	Food and live animals	2334281	221023	935004	1108114	105347	9.5	40.1	47.5	4.5
2005	Food and live animals	3479962	243912	1137460	1451725	79824	7.0	32.7	41.7	2.3
2006	Food and live animals	7211321	263009	2569932	4351386	317681	3.6	35.6	60.3	4.4
2007	Food and live animals	10553473	361249	3892538	6559828	335986	3.4	36.9	62.2	3.2
2008	Food and live animals	8258265	339510	2322063	3661543	313241	4.1	28.1	44.3	3.8
2009	Food and live animals	8248548	270479	2404311	3315791	404734	3.3	29.1	40.2	4.9
2010	Food and live animals	9279525	414333	2214114	4178037	456309	4.5	23.9	45.0	4.9
2011	Food and live animals	24315599	538124	5106143	10008352	1157094	2.2	21.0	41.2	4.8
2012	Food and live animals	14424362	597123	3040768	5600543	853899	4.1	21.1	38.8	5.9
2013	Food and live animals	13587606	737782	3498502	6006292	879198	5.4	25.7	44.2	6.5
2014	Food and live animals	13401862	466258	3727083	6147457	598653	3.5	27.8	45.9	4.5
2015	Food and live animals	5334003	376117	1615165	1943826	183524	7.1	30.3	36.4	3.4
		ECOWAS Imports by destination					Import share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Beverages and tobacco	228433	9969	177781	196938	150	4.4	77.8	86.2	0.1
1997	Beverages and tobacco	239367	6736	173249	211969	476	2.8	72.4	88.6	0.2
1998	Beverages and tobacco	228947	9043	163248	190848	2103	3.9	71.3	83.4	0.9
1999	Beverages and tobacco	223799	11328	153787	200392	1192	5.1	68.7	89.5	0.5
2000	Beverages and tobacco	257293	20751	149458	224492	1065	8.1	58.1	87.3	0.4
2001	Beverages and tobacco	413849	55077	251937	326000	1494	13.3	60.9	78.8	0.4
2002	Beverages and tobacco	355644	42685	222999	273705	2803	12.0	62.7	77.0	0.8
2003	Beverages and tobacco	367967	56729	215651	251234	4541	15.4	58.6	68.3	1.2
2004	Beverages and tobacco	334024	77653	172511	208311	6196	23.2	51.6	62.4	1.9
2005	Beverages and tobacco	369274	67877	184137	215521	2610	18.4	49.9	58.4	0.7
2006	Beverages and tobacco	447383	47435	236518	286022	9339	10.6	52.9	63.9	2.1
2007	Beverages and tobacco	687456	98307	319505	386427	19656	14.3	46.5	56.2	2.9
2008	Beverages and tobacco	707615	142674	308269	348399	22248	20.2	43.6	49.2	3.1
2009	Beverages and tobacco	592067	113994	226936	267026	17391	19.3	38.3	45.1	2.9
2010	Beverages and tobacco	696120	136260	283093	348048	13756	19.6	40.7	50.0	2.0
2011	Beverages and tobacco	877892	154734	392698	443837	32825	17.6	44.7	50.6	3.7

2012	Beverages and tobacco	1076988	165578	321656	637857	25197	15.4	29.9	59.2	2.3
2013	Beverages and tobacco	2260996	1525192	387990	430948	34075	67.5	17.2	19.1	1.5
2014	Beverages and tobacco	908621	203531	399496	449818	24935	22.4	44.0	49.5	2.7
2015	Beverages and tobacco	546288	149012	299864	309995	1636	27.3	54.9	56.7	0.3

		ECOWAS Imports by destination					Import share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Crude materials, inedible except fuels; mineral fuel	351200	64243	128587	230857	2147	18.3	36.6	65.7	0.6
1997	Crude materials, inedible except fuels; mineral fuel	480301	66933	167500	342905	1838	13.9	34.9	71.4	0.4
1998	Crude materials, inedible except fuels; mineral fuel	490617	53396	197379	332508	1567	10.9	40.2	67.8	0.3
1999	Crude materials, inedible except fuels; mineral fuel	424851	48333	185910	306292	1576	11.4	43.8	72.1	0.4
2000	Crude materials, inedible except fuels; mineral fuel	358610	65425	152072	238861	2440	18.2	42.4	66.6	0.7
2001	Crude materials, inedible except fuels; mineral fuel	542279	228423	143598	233571	5037	42.1	26.5	43.1	0.9
2002	Crude materials, inedible except fuels; mineral fuel	435854	75824	166055	283786	15404	17.4	38.1	65.1	3.5
2003	Crude materials, inedible except fuels; mineral fuel	509171	107101	185651	288801	15241	21.0	36.5	56.7	3.0
2004	Crude materials, inedible except fuels; mineral fuel	307995	79893	111980	162320	1653	25.9	36.4	52.7	0.5
2005	Crude materials, inedible except fuels; mineral fuel	395402	79906	150542	223524	3014	20.2	38.1	56.5	0.8
2006	Crude materials, inedible except fuels; mineral fuel	591018	76452	197776	373033	34818	12.9	33.5	63.1	5.9
2007	Crude materials, inedible except fuels; mineral fuel	896690	107969	321810	581035	45969	12.0	35.9	64.8	5.1
2008	Crude materials, inedible except fuels; mineral fuel	1185293	121196	321953	694080	54516	10.2	27.2	58.6	4.6
2009	Crude materials, inedible except fuels; mineral fuel	1010237	91745	316660	492752	49687	9.1	31.3	48.8	4.9
2010	Crude materials, inedible except fuels; mineral fuel	1257755	119830	328439	607647	60836	9.5	26.1	48.3	4.8
2011	Crude materials, inedible except fuels; mineral fuel	4329231	133800	2046180	3523846	245273	3.1	47.3	81.4	5.7
2012	Crude materials, inedible except fuels; mineral fuel	1301466	117691	342045	705405	117140	9.0	26.3	54.2	9.0
2013	Crude materials, inedible except fuels; mineral fuel	2217345	206228	1176784	1426484	172910	9.3	53.1	64.3	7.8
2014	Crude materials, inedible except fuels; mineral fuel	1127952	93566	298089	580431	161141	8.3	26.4	51.5	14.3
2015	Crude materials, inedible except fuels; mineral fuel	507159	66111	174460	273392	26083	13.0	34.4	53.9	5.1

		ECOWAS Imports by destination					Import share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Mineral fuels - petroleum, gas, coal	2278535	1335721	389292	461079	118	58.6	17.1	20.2	0.0
1997	Mineral fuels - petroleum, gas, coal	2548310	1430477	693326	731048	384	56.1	27.2	28.7	0.0
1998	Mineral fuels - petroleum, gas, coal	2026911	1024240	695609	664882	656	50.5	34.3	32.8	0.0
1999	Mineral fuels - petroleum, gas, coal	2043509	1222299	469277	515038	1909	59.8	23.0	25.2	0.1
2000	Mineral fuels - petroleum, gas, coal	2737695	1981087	407591	476567	11220	72.4	14.9	17.4	0.4
2001	Mineral fuels - petroleum, gas, coal	2495366	1464608	502999	665615	13578	58.7	20.2	26.7	0.5
2002	Mineral fuels - petroleum, gas, coal	2441747	1527108	308670	389329	14717	62.5	12.6	15.9	0.6
2003	Mineral fuels - petroleum, gas, coal	4799122	1962089	327037	400181	7386	40.9	6.8	8.3	0.2
2004	Mineral fuels - petroleum, gas, coal	2802621	2155731	304895	311572	1028	76.9	10.9	11.1	0.0
2005	Mineral fuels - petroleum, gas, coal	4308685	3287602	497774	541060	3099	76.3	11.6	12.6	0.1

2006	Mineral fuels - petroleum, gas, coal	5325580	3213944	1134470	1244333	79776	60.3	21.3	23.4	1.5
2007	Mineral fuels - petroleum, gas, coal	6803329	3708686	1792721	2054209	22989	54.5	26.4	30.2	0.3
2008	Mineral fuels - petroleum, gas, coal	8995505	5414362	1899872	2108559	24899	60.2	21.1	23.4	0.3
2009	Mineral fuels - petroleum, gas, coal	4553458	2525077	1209500	1292238	14981	55.5	26.6	28.4	0.3
2010	Mineral fuels - petroleum, gas, coal	6701018	3752958	1714835	1953789	18285	56.0	25.6	29.2	0.3
2011	Mineral fuels - petroleum, gas, coal	13865154	4733700	3269804	7126950	132346	34.1	23.6	51.4	1.0
2012	Mineral fuels - petroleum, gas, coal	9318280	5522470	2057296	2303231	22248	59.3	22.1	24.7	0.2
2013	Mineral fuels - petroleum, gas, coal	17662876	5062188	7618491	8201550	21106	28.7	43.1	46.4	0.1
2014	Mineral fuels - petroleum, gas, coal	16235493	5297516	8353102	8877448	53026	32.6	51.4	54.7	0.3
2015	Mineral fuels - petroleum, gas, coal	5873102	2822548	1747602	2019073	8974	48.1	29.8	34.4	0.2

		ECOWAS Imports by destination					Import share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Animals and vegetable oils and fats	185803	30679	76531	113435	134	16.5	41.2	61.1	0.1
1997	Animals and vegetable oils and fats	158226	32728	81239	81652	75	20.7	51.3	51.6	0.0
1998	Animals and vegetable oils and fats	213834	38755	76427	118025	21	18.1	35.7	55.2	0.0
1999	Animals and vegetable oils and fats	259294	82148	98956	128615	28	31.7	38.2	49.6	0.0
2000	Animals and vegetable oils and fats	162836	37349	70488	94099	68	22.9	43.3	57.8	0.0
2001	Animals and vegetable oils and fats	180259	43436	59954	83734	197	24.1	33.3	46.5	0.1
2002	Animals and vegetable oils and fats	206831	46349	67173	91878	386	22.4	32.5	44.4	0.2
2003	Animals and vegetable oils and fats	367906	64515	69459	120631	2728	17.5	18.9	32.8	0.7
2004	Animals and vegetable oils and fats	250220	56768	47469	76482	2017	22.7	19.0	30.6	0.8
2005	Animals and vegetable oils and fats	291794	66302	35502	66187	5435	22.7	12.2	22.7	1.9
2006	Animals and vegetable oils and fats	393964	51525	57891	114722	23450	13.1	14.7	29.1	6.0
2007	Animals and vegetable oils and fats	595371	75797	78834	175924	18421	12.7	13.2	29.5	3.1
2008	Animals and vegetable oils and fats	717773	110465	93309	177685	18197	15.4	13.0	24.8	2.5
2009	Animals and vegetable oils and fats	441135	40723	43576	89628	17548	9.2	9.9	20.3	4.0
2010	Animals and vegetable oils and fats	732319	83414	49318	150356	12511	11.4	6.7	20.5	1.7
2011	Animals and vegetable oils and fats	952217	155748	72041	251560	20575	16.4	7.6	26.4	2.2
2012	Animals and vegetable oils and fats	920087	241113	86883	167517	8602	26.2	9.4	18.2	0.9
2013	Animals and vegetable oils and fats	967084	236503	79451	121774	14592	24.5	8.2	12.6	1.5
2014	Animals and vegetable oils and fats	1082521	238165	51075	133442	17386	22.0	4.7	12.3	1.6
2015	Animals and vegetable oils and fats	485928	123170	41434	58930	12857	25.3	8.5	12.1	2.6

		ECOWAS Imports by destination					Import share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Chemicals	2202680	125812	1310718	1539063	77662	5.7	59.5	69.9	3.5
1997	Chemicals	2700247	130397	1361584	1612246	419356	4.8	50.4	59.7	15.5
1998	Chemicals	2539370	160132	1488150	1769941	61203	6.3	58.6	69.7	2.4
1999	Chemicals	2145472	127980	1280688	1576259	49023	6.0	59.7	73.5	2.3
2000	Chemicals	2435883	123978	1321870	1649256	65776	5.1	54.3	67.7	2.7
2001	Chemicals	2781483	181182	1471670	1904448	99864	6.5	52.9	68.5	3.6
2002	Chemicals	3071980	186864	1522056	2043424	140775	6.1	49.5	66.5	4.6

2003	Chemicals	3210633	265198	1494171	2054766	158823	8.3	46.5	64.0	4.9
2004	Chemicals	1561747	213401	870160	1014773	39595	13.7	55.7	65.0	2.5
2005	Chemicals	2122895	222642	1068413	1316962	86844	10.5	50.3	62.0	4.1
2006	Chemicals	5833197	183332	2369342	3542065	573125	3.1	40.6	60.7	9.8
2007	Chemicals	8265030	245725	3414587	5030423	669812	3.0	41.3	60.9	8.1
2008	Chemicals	7131866	240576	2615792	3757839	691586	3.4	36.7	52.7	9.7
2009	Chemicals	7523171	214096	2023799	2986042	1063428	2.8	26.9	39.7	14.1
2010	Chemicals	8555264	298001	2350791	4019104	873025	3.5	27.5	47.0	10.2
2011	Chemicals	9606360	334771	3205794	4665393	1280389	3.5	33.4	48.6	13.3
2012	Chemicals	9385078	426018	3116435	4572952	1330098	4.5	33.2	48.7	14.2
2013	Chemicals	10430022	410252	3227220	4735579	1803759	3.9	30.9	45.4	17.3
2014	Chemicals	9554190	309394	3023931	4337736	1594517	3.2	31.7	45.4	16.7
2015	Chemicals	3375661	210040	1293760	1662673	399299	6.2	38.3	49.3	11.8

		ECOWAS Imports by destination					Import share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Manufactured goods	2911535	171577	1650240	1932304	117386	5.9	56.7	66.4	4.0
1997	Manufactured goods	2801022	155461	1585527	1889592	137246	5.6	56.6	67.5	4.9
1998	Manufactured goods	2981445	189657	1572928	1844452	128437	6.4	52.8	61.9	4.3
1999	Manufactured goods	2690874	171638	1347257	1674847	143395	6.4	50.1	62.2	5.3
2000	Manufactured goods	2704924	180029	1189675	1550328	155330	6.7	44.0	57.3	5.7
2001	Manufactured goods	3278094	225709	1346961	1785100	239784	6.9	41.1	54.5	7.3
2002	Manufactured goods	3465387	322108	1266530	1899741	254630	9.3	36.5	54.8	7.3
2003	Manufactured goods	4312861	406438	1722548	2363157	358308	9.4	39.9	54.8	8.3
2004	Manufactured goods	1990765	285866	750950	955741	170457	14.4	37.7	48.0	8.6
2005	Manufactured goods	3103488	358114	1058827	1443993	370669	11.5	34.1	46.5	11.9
2006	Manufactured goods	6620784	328097	2291282	3315129	925786	5.0	34.6	50.1	14.0
2007	Manufactured goods	11525437	1123802	3295130	4930697	1922544	9.8	28.6	42.8	16.7
2008	Manufactured goods	11999057	1389946	3049088	4415408	2174138	11.6	25.4	36.8	18.1
2009	Manufactured goods	10242672	369990	2674971	3870386	2177792	3.6	26.1	37.8	21.3
2010	Manufactured goods	15091482	606827	3816708	6549308	2999952	4.0	25.3	43.4	19.9
2011	Manufactured goods	13379618	871179	3382488	5840746	3244182	6.5	25.3	43.7	24.2
2012	Manufactured goods	11989928	813392	2557605	4482585	3332097	6.8	21.3	37.4	27.8
2013	Manufactured goods	12594423	650588	3008314	4659098	4194823	5.2	23.9	37.0	33.3
2014	Manufactured goods	11168998	527546	2729728	4520366	3568324	4.7	24.4	40.5	31.9
2015	Manufactured goods	4036622	381645	1347117	1707676	1089173	9.5	33.4	42.3	27.0

		ECOWAS Imports by destination					Import share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Machinery and transport equipment	4691295.1	18022.8	2650742.3	3973590.5	135603.6	0.4	56.5	84.7	2.9
1997	Machinery and transport equipment	5387924.1	26648.1	2854828.9	4573343.3	166177.7	0.5	53.0	84.9	3.1
1998	Machinery and transport equipment	5160946.8	27508.0	2837557.9	4232662.7	170940.7	0.5	55.0	82.0	3.3
1999	Machinery and transport equipment	4529884.8	41191.8	2606978.8	3806018.2	177603.9	0.9	57.6	84.0	3.9

2000	Machinery and transport equipment	4464337.7	59760.0	2648170.3	3702293.6	168456.5	1.3	59.3	82.9	3.8
2001	Machinery and transport equipment	4996438.2	95538.4	2811130.0	3949931.4	283134.0	1.9	56.3	79.1	5.7
2002	Machinery and transport equipment	5802216.3	90410.1	2924838.8	4333161.5	386321.1	1.6	50.4	74.7	6.7
2003	Machinery and transport equipment	8702971.3	96538.2	4149770.0	6513944.1	725393.3	1.1	47.7	74.8	8.3
2004	Machinery and transport equipment	2931624.6	76447.2	1852911.5	2488823.9	149541.4	2.6	63.2	84.9	5.1
2005	Machinery and transport equipment	5032181.2	124311.4	2737304.0	3762869.1	313101.0	2.5	54.4	74.8	6.2
2006	Machinery and transport equipment	13670990.1	75394.5	6539013.9	10014444.1	1391641.7	0.6	47.8	73.3	10.2
2007	Machinery and transport equipment	18485734.5	136819.8	8243386.1	12202767.6	3336564.9	0.7	44.6	66.0	18.0
2008	Machinery and transport equipment	21909980.7	121998.7	8484625.0	13419326.2	3350163.9	0.6	38.7	61.2	15.3
2009	Machinery and transport equipment	22949453.9	115332.5	6870073.2	10640293.6	3974096.2	0.5	29.9	46.4	17.3
2010	Machinery and transport equipment	31942888.2	687480.8	8626118.1	16906406.7	5924918.4	2.2	27.0	52.9	18.5
2011	Machinery and transport equipment	30462144.0	250855.2	9342122.4	17450354.3	6433033.7	0.8	30.7	57.3	21.1
2012	Machinery and transport equipment	27822454.6	252892.1	9170533.8	15996987.3	5809009.2	0.9	33.0	57.5	20.9
2013	Machinery and transport equipment	27649465.4	237433.1	8418167.0	14181513.1	7180316.8	0.9	30.4	51.3	26.0
2014	Machinery and transport equipment	24236711.1	210532.5	7486836.1	12842018.7	6390172.1	0.9	30.9	53.0	26.4
2015	Machinery and transport equipment	7535992.2	172007.6	3363487.7	4605912.2	1541566.3	2.3	44.6	61.1	20.5

		ECOWAS Imports by destination					Import share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Miscellaneous- furniture and sanitary	889013	24484	523356	633959	63182	2.8	58.9	71.3	7.1
1997	Miscellaneous- furniture and sanitary	835548	24026	467384	576231	71829	2.9	55.9	69.0	8.6
1998	Miscellaneous- furniture and sanitary	856755	26882	449799	557112	85827	3.1	52.5	65.0	10.0
1999	Miscellaneous- furniture and sanitary	846781	22965	411651	544557	99019	2.7	48.6	64.3	11.7
2000	Miscellaneous- furniture and sanitary	782577	28015	386199	488318	94230	3.6	49.3	62.4	12.0
2001	Miscellaneous- furniture and sanitary	912942	40356	473331	567446	117340	4.4	51.8	62.2	12.9
2002	Miscellaneous- furniture and sanitary	951213	46213	462320	562351	153538	4.9	48.6	59.1	16.1
2003	Miscellaneous- furniture and sanitary	1105909	50828	483756	609174	203917	4.6	43.7	55.1	18.4
2004	Miscellaneous- furniture and sanitary	687199	50025	365379	414515	110945	7.3	53.2	60.3	16.1
2005	Miscellaneous- furniture and sanitary	1112865	51807	573706	643958	235595	4.7	51.6	57.9	21.2
2006	Miscellaneous- furniture and sanitary	1929701	47262	856058	1040173	490430	2.4	44.4	53.9	25.4
2007	Miscellaneous- furniture and sanitary	2435724	85075	930405	1148384	767085	3.5	38.2	47.1	31.5
2008	Miscellaneous- furniture and sanitary	2998045	81479	1021359	1260196	849646	2.7	34.1	42.0	28.3
2009	Miscellaneous- furniture and sanitary	3098821	57523	840447	1103088	1010575	1.9	27.1	35.6	32.6
2010	Miscellaneous- furniture and sanitary	3962909	119987	968105	1631545	1078559	3.0	24.4	41.2	27.2
2011	Miscellaneous- furniture and sanitary	4066138	192394	819932	1585272	1415964	4.7	20.2	39.0	34.8
2012	Miscellaneous- furniture and sanitary	3162396	141946	816509	1197009	1223832	4.5	25.8	37.9	38.7
2013	Miscellaneous- furniture and sanitary	3267326	135072	840785	1241390	1291890	4.1	25.7	38.0	39.5
2014	Miscellaneous- furniture and sanitary	3271613	112771	831975	1105499	1221818	3.4	25.4	33.8	37.3
2015	Miscellaneous- furniture and sanitary	1371484	74805	456760	580532	454165	5.5	33.3	42.3	33.1

		ECOWAS Imports by destination					Import share (%) by destination			
Year	Product category	Total to the World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	Commodity -firearms, zoo animals, coin etc.	249807.4	4391.9	160840.6	193153.1	5449.7	1.8	64.4	77.3	2.2

1997	Commodity -firearms, zoo animals, coin etc.	286713.5	3442.2	178405.0	216890.2	7940.1	1.2	62.2	75.6	2.8
1998	Commodity -firearms, zoo animals, coin etc.	107110.1	6120.7	60044.2	72348.3	1289.5	5.7	56.1	67.5	1.2
1999	Commodity -firearms, zoo animals, coin etc.	70605.5	6885.5	26705.9	43673.9	529.8	9.8	37.8	61.9	0.8
2000	Commodity -firearms, zoo animals, coin etc.	47916.5	4226.9	15897.7	28389.5	120.6	8.8	33.2	59.2	0.3
2001	Commodity -firearms, zoo animals, coin etc.	25903.8	2933.6	12940.6	16724.1	1483.9	11.3	50.0	64.6	5.7
2002	Commodity -firearms, zoo animals, coin etc.	18443.9	1705.7	10808.5	13669.3	591.9	9.2	58.6	74.1	3.2
2003	Commodity -firearms, zoo animals, coin etc.	452267.0	9310.1	424317.7	430443.4	1142.6	2.1	93.8	95.2	0.3
2004	Commodity -firearms, zoo animals, coin etc.	509136.2	2398.2	482034.4	488600.3	1510.0	0.5	94.7	96.0	0.3
2005	Commodity -firearms, zoo animals, coin etc.	1413086.7	226733.7	589493.4	599873.1	988.2	16.0	41.7	42.5	0.1
2006	Commodity -firearms, zoo animals, coin etc.	1242144.0	8444.7	372891.8	478495.2	648942.6	0.7	30.0	38.5	52.2
2007	Commodity -firearms, zoo animals, coin etc.	397835.3	3107.2	312572.7	334262.4	26209.7	0.8	78.6	84.0	6.6
2008	Commodity -firearms, zoo animals, coin etc.	109340.7	3407.8	53663.6	65704.2	20279.2	3.1	49.1	60.1	18.5
2009	Commodity -firearms, zoo animals, coin etc.	570550.7	2571.9	237649.7	267139.3	113539.2	0.5	41.7	46.8	19.9
2010	Commodity -firearms, zoo animals, coin etc.	92924.0	2431.3	33232.8	41067.2	12831.8	2.6	35.8	44.2	13.8
2011	Commodity -firearms, zoo animals, coin etc.	132590.5	3979.2	20193.4	26245.0	15821.4	3.0	15.2	19.8	11.9
2012	Commodity -firearms, zoo animals, coin etc.	84479.3	12273.6	30627.9	38367.8	13026.0	14.5	36.3	45.4	15.4
2013	Commodity -firearms, zoo animals, coin etc.	246172.8	20082.8	88729.5	145221.5	33570.0	8.2	36.0	59.0	13.6
2014	Commodity -firearms, zoo animals, coin etc.	128146.4	2826.7	47300.8	58303.9	15166.4	2.2	36.9	45.5	11.8
2015	Commodity -firearms, zoo animals, coin etc.	198583.0	4628.8	153074.3	159477.8	5972.8	2.3	77.1	80.3	3.0

Appendix 4A.2: Total ECOWAS imports to the World and from selected trade partners and share

	Total ECOWAS imports by destination					Share by destination (%)			
Year	World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	16816857	1892047	8187574	10774938	450388	11.3	48.7	64.1	2.7
1997	18408451	1985260	8697268	11755862	854721	10.8	47.2	63.9	4.6
1998	17818300	1668845	8823183	11444199	554603	9.4	49.5	64.2	3.1
1999	16361421	1850573	7922390	10763540	563159	11.3	48.4	65.8	3.4
2000	16703539	2636874	7635747	10171571	637816	15.8	45.7	60.9	3.8
2001	19246128	2590635	8636501	11678146	958616	13.5	44.9	60.7	5.0
2002	20651721	2581277	8495619	12104382	1186761	12.5	41.1	58.6	5.7
2003	28439024	3263465	10883979	15804714	1658738	11.5	38.3	55.6	5.8
2004	13709613	3219206	5893294	7229252	588289	23.5	43.0	52.7	4.3
2005	21629634	4729207	8033159	10265672	1101178	21.9	37.1	47.5	5.1
2006	43266082	4294894	16625173	24759802	4494990	9.9	38.4	57.2	10.4
2007	60646082	5946537	22601488	33403956	7165235	9.8	37.3	55.1	11.8
2008	64012741	7965614	20169994	29908739	7518915	12.4	31.5	46.7	11.7
2009	59230113	3801531	16847922	24324386	8843770	6.4	28.4	41.1	14.9

2010	78312202	6221522	20384754	36385309	11450982	7.9	26.0	46.5	14.6
2011	101986945	7369282	27657394	50922554	13977503	7.2	27.1	49.9	13.7
2012	79485518	8290497	21540358	35702453	12735149	10.4	27.1	44.9	16.0
2013	90883316	9221321	28344432	41149849	15626240	10.1	31.2	45.3	17.2
2014	81116107	7462107	26948616	39052520	13645139	9.2	33.2	48.1	16.8
2015	29264821	4380085	10492723	13321486	3723251	15.0	35.9	45.5	12.7

Source: World Integrated Trade Solutions. The data is total ECOWAS imports by destination to the world and selected trade partners and their percentage share in the last four columns.

Appendix 4A.3: Total ECOWAS exports to the World and to selected trade partners and share

	Total ECOWAS exports by destination					Share by destination (%)			
Year	World	ECOWAS	EU27	OECD	China	ECOWAS	EU27	OECD	China
1996	18815608.0	1980252.0	8653414.8	14300285.7	40048.8	10.5	46.0	76.0	0.2
1997	18428386.4	2352383.9	6970734.9	13074895.4	29870.4	12.8	37.8	70.9	0.2
1998	14491406.6	2247442.4	5665046.9	9639964.7	58532.8	15.5	39.1	66.5	0.4
1999	23586759.9	2746479.8	6971159.8	14207587.2	200237.1	11.6	29.6	60.2	0.8
2000	33848123.4	3057978.8	9239909.1	22690128.7	185065.2	9.0	27.3	67.0	0.5
2001	25049411.1	2398860.3	7551059.9	16264700.0	166105.7	9.6	30.1	64.9	0.7
2002	25521647.0	2983470.5	7585977.6	15103955.2	115941.8	11.7	29.7	59.2	0.5
2003	33761244.0	3290872.4	9992860.2	21977867.5	319051.2	9.7	29.6	65.1	0.9
2004	10513672.0	2771795.6	4470859.5	5494800.5	223024.4	26.4	42.5	52.3	2.1
2005	13392831.3	3616472.0	5373319.0	6955783.1	315376.1	27.0	40.1	51.9	2.4
2006	72325225.9	6736095.8	18538137.8	52180514.7	323900.9	9.3	25.6	72.1	0.4
2007	68444941.2	5971865.1	16340833.0	45674736.3	1057944.2	8.7	23.9	66.7	1.5
2008	99632461.6	10702363.3	24574548.2	63861793.4	528104.2	10.7	24.7	64.1	0.5
2009	66001074.9	6896706.5	18048073.9	35134504.3	928773.0	10.4	27.3	53.2	1.4
2010	102582595.9	6706815.0	25026219.2	61163875.3	1721286.2	6.5	24.4	59.6	1.7
2011	154771310.2	13999453.0	45863038.1	85471508.0	3091526.5	9.0	29.6	55.2	2.0
2012	167942867.5	12426580.5	60442606.8	93902878.7	9230580.8	7.4	36.0	55.9	5.5
2013	115766628.3	12439673.3	47309185.9	62756049.4	2125527.3	10.7	40.9	54.2	1.8
2014	122096180.8	10318391.8	48351937.7	62584597.9	2314733.2	8.5	39.6	51.3	1.9
2015	15934910.5	3695685.4	6263354.8	8270572.3	352491.2	23.2	39.3	51.9	2.2

Source: World Integrated Trade Solutions. The data is total ECOWAS exports by destination to the world and selected trade partners and their percentage share in the last four columns.

Appendix 4A.4: RCA calculation data

	WORLD data		ECOWAS data		RCA
Year	World export	Food and live animals	ECOWAS export to world	Food and live animals	RCA
1996	4925070773	358577357	18815608	3465312	2.5
1997	5113944854	353743588	18428386	3159938	2.5
1998	5078295008	338852552	14491407	3352999	3.5
1999	5277849583	329708639	23586760	3165476	2.1
2000	6028801339	325008433	33832052	2716075	1.5
2001	5798093139	339583510	25049400	2852754	1.9
2002	6073158748	357301901	25806580	3272526	2.2
2003	7053265440	411937589	33761244	4508580	2.3
2004	8543503480	470012244	10513672	3692912	6.4
2005	9702236285	516071628	13392831	4487204	6.3
2006	11235768601	569866530	72325226	4865351	1.3
2007	13003022177	680523919	68444941	5813222	1.6
2008	14994261894	816788915	99632462	6959721	1.3
2009	11464801281	742081794	66001075	8744025	2.0
2010	14074717118	833580418	102582596	8848698	1.5
2011	16826600110	1005619121	154771310	11219384	1.2
2012	16644764180	1014457088	167942867	14787403	1.4
2013	17277140470	1080973477	115766628	10731062	1.5
2014	17297109160	1115267474	122096181	8533933	1.1
2015	14005513961	938059140	15934910	7604028	7.1

	WORLD data		ECOWAS data		RCA
Year	World export	Beverages and tobacco	ECOWAS export to world	Beverages and tobacco	RCA
1996	4925070773	57034683	18815608	19655	0.1
1997	5113944854	57285040	18428386	11379	0.1
1998	5078295008	55238641	14491407	17386	0.1
1999	5277849583	55732446	23586760	23691	0.1
2000	6028801339	54018369	33832052	44930	0.1
2001	5798093139	54816058	25049400	77559	0.3
2002	6073158748	58976360	25806580	49900	0.2
2003	7053265440	67364271	33761244	97115	0.3
2004	8543503480	75525847	10513672	98585	1.1
2005	9702236285	80210826	13392831	121354	1.1
2006	11235768601	88477176	72325226	87927	0.2
2007	13003022177	103586679	68444941	207447	0.4
2008	14994261894	114519904	99632462	268165	0.4
2009	11464801281	104826648	66001075	312884	0.5
2010	14074717118	111337695	102582596	424174	0.5
2011	16826600110	129801359	154771310	455175	0.4
2012	16644764180	134609422	167942867	515289	0.4
2013	17277140470	142035670	115766628	518228	0.5
2014	17297109160	142330526	122096181	427082	0.4
2015	14005513961	118837659	15934910	210055	1.6

	WORLD data		ECOWAS data		RCA
Year	World export	Crude materials, inedible except fuels; mineral fuel	ECOWAS export to world	Crude materials, inedible except fuels; mineral fuel	RCA
1996	4925070773	181849147	18815608	2518286	3.6
1997	5113944854	185471248	18428386	2006653	3.0
1998	5078295008	167427017	14491407	2037957	4.3
1999	5277849583	159898007	23586760	1807243	2.5
2000	6028801339	181730847	33832052	1660032	1.6
2001	5798093139	171574583	25049400	1479942	2.0
2002	6073158748	179088961	25806580	1427847	1.9

2003	7053265440	212203312	33761244	1820818	1.8
2004	8543503480	269540196	10513672	2360399	7.1
2005	9702236285	309834002	13392831	2438892	5.7
2006	11235768601	378335119	72325226	2146349	0.9
2007	13003022177	460953475	68444941	3579992	1.5
2008	14994261894	529591245	99632462	4200844	1.2
2009	11464801281	403169664	66001075	2609208	1.1
2010	14074717118	582806803	102582596	4893268	1.2
2011	16826600110	745503911	154771310	12163754	1.8
2012	16644764180	695612809	167942867	13978267	2.0
2013	17277140470	701601807	115766628	8110633	1.7
2014	17297109160	664221103	122096181	4897461	1.0
2015	14005513961	517571781	15934910	3163547	5.4

	WORLD data		ECOWAS data		RCA
Year	World export	Mineral fuels - petroleum, gas, coal	ECOWAS export to world	Mineral fuels - petroleum, gas, coal	RCA
1996	4925070773	378132359	18815608	11636680	8.1
1997	5113944854	353662341	18428386	11443048	9.0
1998	5078295008	298232851	14491407	7230227	8.5
1999	5277849583	381665644	23586760	16638354	9.8
2000	6028801339	641185288	33832052	27907809	7.8
2001	5798093139	581594743	25049400	18807535	7.5
2002	6073158748	563037398	25806580	18076209	7.6
2003	7053265440	685714412	33761244	24311017	7.4
2004	8543503480	892745027	10513672	1490389	1.4
2005	9702236285	1245052706	13392831	2414672	1.4
2006	11235768601	1567280009	72325226	61214648	6.1
2007	13003022177	1772528223	68444941	53538729	5.7
2008	14994261894	2572015850	99632462	79580392	4.7
2009	11464801281	1576288608	66001075	48680678	5.4
2010	14074717118	2162365883	102582596	78312366	5.0
2011	16826600110	2955032016	154771310	122394665	4.5
2012	16644764180	2889796825	167942867	128706230	4.4
2013	17277140470	3078344415	115766628	86323908	4.2
2014	17297109160	2794237648	122096181	97003500	4.9
2015	14005513961	1556048243	15934910	1882087	1.1

	WORLD data		ECOWAS data		RCA
Year	World export	Animals and vegetable oils and fats	ECOWAS export to world	Animals and vegetable oils and fats	RCA
1996	4925070773	23529852	18815608	114053	1.3
1997	5113944854	25651932	18428386	85205	0.9
1998	5078295008	26976713	14491407	165264	2.1
1999	5277849583	23429026	23586760	128597	1.2
2000	6028801339	18844154	33832052	129705	1.2
2001	5798093139	18465008	25049400	135340	1.7
2002	6073158748	23977360	25806580	76175	0.7
2003	7053265440	30241269	33761244	122356	0.8
2004	8543503480	36406428	10513672	134121	3.0
2005	9702236285	37262031	13392831	143960	2.8
2006	11235768601	43103537	72325226	118902	0.4
2007	13003022177	59417676	68444941	213524	0.7
2008	14994261894	86349207	99632462	245566	0.4
2009	11464801281	62926288	66001075	245052	0.7
2010	14074717118	78182090	102582596	300168	0.5
2011	16826600110	107144887	154771310	498263	0.5
2012	16644764180	104731637	167942867	548177	0.5
2013	17277140470	96150043	115766628	558283	0.9
2014	17297109160	94206176	122096181	363613	0.5
2015	14005513961	79443320	15934910	361399	4.0

	WORLD data		ECOWAS data		RCA
Year	World export	Chemicals	ECOWAS export to world	Chemicals	RCA
1996	4925070773	471476660	18815608	340172	0.2
1997	5113944854	494992752	18428386	400086	0.2
1998	5078295008	509979969	14491407	547528	0.4
1999	5277849583	526056318	23586760	480420	0.2
2000	6028801339	554404064	33832052	350687	0.1
2001	5798093139	576668209	25049400	452083	0.2
2002	6073158748	645314645	25806580	607566	0.2
2003	7053265440	773121596	33761244	521689	0.1

2004	8543503480	946323674	10513672	743431	0.6
2005	9702236285	1067241727	13392831	667171	0.5
2006	11235768601	1207538063	72325226	548757	0.1
2007	13003022177	1420234263	68444941	863945	0.1
2008	14994261894	1618274222	99632462	2185078	0.2
2009	11464801281	1376694770	66001075	1119546	0.1
2010	14074717118	1622731563	102582596	1379167	0.1
2011	16826600110	1900394817	154771310	1654918	0.1
2012	16644764180	1865737311	167942867	1530739	0.1
2013	17277140470	1931335780	115766628	1508306	0.1
2014	17297109160	1959443623	122096181	917895	0.1
2015	14005513961	1688874559	15934910	585734	0.3

	WORLD data		ECOWAS data		RCA
Year	World export	Manufactured goods	ECOWAS export to world	Manufactured goods	RCA
1996	4925070773	775361019	18815608	531274	0.2
1997	5113944854	796372991	18428386	650744	0.2
1998	5078295008	781415540	14491407	554025	0.2
1999	5277849583	773293961	23586760	688252	0.2
2000	6028801339	828525721	33832052	634956	0.1
2001	5798093139	798372034	25049400	699349	0.2
2002	6073158748	844918357	25806580	624468	0.2
2003	7053265440	977995423	33761244	689456	0.1
2004	8543503480	1224806762	10513672	608593	0.4
2005	9702236285	1365093451	13392831	1275374	0.7
2006	11235768601	1614572877	72325226	1099147	0.1
2007	13003022177	1899077085	68444941	1668053	0.2
2008	14994261894	2082643164	99632462	2332457	0.2
2009	11464801281	1482653746	66001075	2040990	0.2
2010	14074717118	1849332174	102582596	5139410	0.4
2011	16826600110	2223209019	154771310	3254762	0.2
2012	16644764180	2116703681	167942867	3702720	0.2
2013	17277140470	2156989506	115766628	3356095	0.2
2014	17297109160	2193010229	122096181	3003511	0.2
2015	14005513961	1811779872	15934910	852742	0.4

	WORLD data		ECOWAS data		RCA
Year	World export	Machinery and transport equipment	ECOWAS export to world	Machinery and transport equipment	RCA
1996	4925070773	1928275677	18815608	96449	0.0
1997	5113944854	2052282185	18428386	497469	0.1
1998	5078295008	2118817599	14491407	361095	0.1
1999	5277849583	2220760866	23586760	439896	0.0
2000	6028801339	2454527058	33832052	141933	0.0
2001	5798093139	2309765185	25049400	294180	0.0
2002	6073158748	2409544823	25806580	1097011	0.1
2003	7053265440	2744311183	33761244	1123589	0.1
2004	8543503480	3284809440	10513672	692376	0.2
2005	9702236285	3603482435	13392831	1080098	0.2
2006	11235768601	4149095902	72325226	1193357	0.0
2007	13003022177	4696704606	68444941	861283	0.0
2008	14994261894	5038360051	99632462	2879449	0.1
2009	11464801281	3859505024	66001075	1483431	0.1
2010	14074717118	4718511155	102582596	2150155	0.1
2011	16826600110	5360986909	154771310	2065403	0.0
2012	16644764180	5373117431	167942867	2596411	0.0
2013	17277140470	5550156189	115766628	3341525	0.1
2014	17297109160	5711341048	122096181	4128456	0.1
2015	14005513961	5088094488	15934910	637990	0.1

	WORLD data		ECOWAS data		RCA
Year	World export	Miscellaneous- furniture and sanitary	ECOWAS export to world	Miscellaneous- furniture and sanitary	RCA
1996	4925070773	617639634	18815608	66907	0.0
1997	5113944854	654631045	18428386	142059	0.1
1998	5078295008	656451469	14491407	202974	0.1
1999	5277849583	679463903	23586760	191221	0.1
2000	6028801339	732421879	33832052	225178	0.1
2001	5798093139	723604749	25049400	193959	0.1
2002	6073158748	760724755	25806580	255187	0.1
2003	7053265440	880861732	33761244	221892	0.1
2004	8543503480	1029344968	10513672	186061	0.1
2005	9702236285	1136805618	13392831	220352	0.1

2006	11235768601	1268220422	72325226	475200	0.1
2007	13003022177	1420148395	68444941	644142	0.1
2008	14994261894	1544948658	99632462	679424	0.1
2009	11464801281	1350209846	66001075	586670	0.1
2010	14074717118	1552604740	102582596	985660	0.1
2011	16826600110	1799512115	154771310	837538	0.1
2012	16644764180	1861206267	167942867	738810	0.0
2013	17277140470	1954087348	115766628	1106944	0.1
2014	17297109160	2031436901	122096181	2605494	0.2
2015	14005513961	1774424779	15934910	442296	0.2

	WORLD data		ECOWAS data		RCA
Year	World export	Commodity -firearms, zoo animals, coin etc.	ECOWAS export to world	Commodity -firearms, zoo animals, coin etc.	RCA
1996	4925070773	133274006	18815608	26821	0.1
1997	5113944854	135184225	18428386	31806	0.1
1998	5078295008	119832398	14491407	21952	0.1
1999	5277849583	127840778	23586760	23611	0.0
2000	6028801339	238135526	33832052	36818	0.0
2001	5798093139	223649060	25049400	56710	0.1
2002	6073158748	230274188	25806580	34759	0.0
2003	7053265440	269514653	33761244	344731	0.3
2004	8543503480	313988894	10513672	506804	1.3
2005	9702236285	341181862	13392831	543755	1.2
2006	11235768601	349278968	72325226	575588	0.3
2007	13003022177	489847855	68444941	1054604	0.4
2008	14994261894	590770678	99632462	301366	0.1
2009	11464801281	506444893	66001075	178590	0.1
2010	14074717118	563264596	102582596	149530	0.0
2011	16826600110	599395956	154771310	227449	0.0
2012	16644764180	588791708	167942867	838821	0.1
2013	17277140470	585466234	115766628	211644	0.1
2014	17297109160	591614432	122096181	215236	0.1
2015	14005513961	432380120	15934910	195034	0.4

Source: Author's Calculation. Data from the World Integrated Trade Solutions

Appendix 4A.5: TCI calculation data

Country/Products	Food and live animals	Animal and Veg fats and oil	Beverages and tobacco	Chemicals	Crude materials	Machinery	Manufactures	Minerals fuels and lubricants	Miscellaneous
Country imports as base and ECOWAS as exporter									
Benin	**65**	**97**	**100**	**95**	**97**	**81**	**87**	**91**	**98**
Burkina Faso	**92**	**99**	**99**	**87**	**99**	**76**	**85**	**79**	**96**
Cape Verde	**74**	**98**	**97**	**95**	**99**	**85**	**86**	**84**	**93**
Cote D'Ivoire	**89**	**100**	**99**	**91**	**99**	**65**	**92**	**79**	**98**
Gambia, The	**70**	**95**	**99**	**97**	**99**	**85**	**90**	**81**	**95**
Ghana	**86**	**99**	**99**	**88**	**99**	**62**	**83**	**101**	**94**
Guinea	**83**	**99**	**98**	**92**	**99**	**81**	**89**	**74**	**95**
Niger	**75**	**97**	**97**	**91**	**96**	**75**	**85**	**100**	**96**
Nigeria	**88**	**100**	**97**	**89**	**97**	**72**	**87**	**85**	**98**
Senegal	**81**	**98**	**99**	**91**	**98**	**82**	**90**	**75**	**97**
Togo	**90**	**98**	**99**	**84**	**99**	**82**	**80**	**83**	**96**
The country exports as a base and ECOWAS imports									
Benin	**92**	**103**	**98**	**89**	**98**	**72**	**92**	**81**	**97**
Burkina Faso	**90**	**99**	**98**	**89**	**103**	**72**	**91**	**90**	**97**
Cape Verde	**85**	**99**	**98**	**89**	**98**	**70**	**86**	**81**	**96**
Cote D'Ivoire	**87**	**101**	**98**	**91**	**98**	**84**	**88**	**91**	**98**
Gambia, The	**87**	**0**	**98**	**88**	**98**	**70**	**86**	**0**	**96**
Ghana	**86**	**99**	**98**	**94**	**98**	**71**	**91**	**81**	**97**
Guinea	**86**	**99**	**98**	**89**	**98**	**71**	**86**	**81**	**99**
Niger	**88**	**99**	**98**	**89**	**98**	**70**	**87**	**112**	**96**
Nigeria	**85**	**99**	**98**	**89**	**98**	**70**	**86**	**85**	**97**
Senegal	**100**	**99**	**100**	**93**	**99**	**71**	**99**	**87**	**98**
Togo	**89**	**105**	**102**	**98**	**99**	**71**	**115**	**81**	**106**

Source: Authors calculation. Data from WITS

Appendix 4A.6: ECOWAS net trade with the world by product category (exports minus imports) 2013

Product Categories	Value	Deficit/ Surplus
Food and Live Animals	2.5 billion	Deficit
Beverages and Tobacco	518 million	Deficit
Manufactures	9.5 billion	Deficit
Animal and Vegetable Fats and Oils	428.8 million	Deficit
Mineral fuels, lubricants and related materials	68.7 billion	Surplus
Chemicals	9.3 billion	Deficit
Crude Materials, inedible except fuels	5.3 billion	Surplus
Machinery and Transport equipment	25.6 billion	Deficit
Miscellaneous- Furniture and Sanitary etc	2.4 billion	Deficit

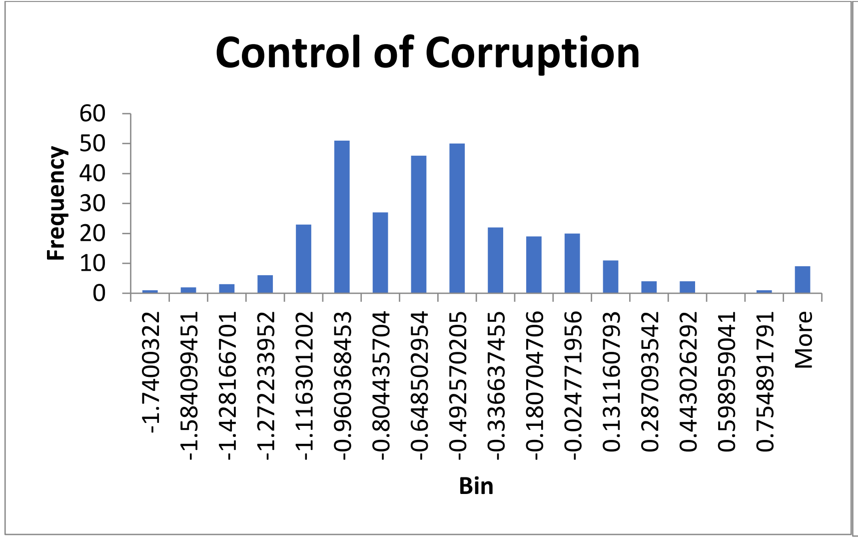
Source: Authors Calculations. Data from the World Integrated Trade Solutions

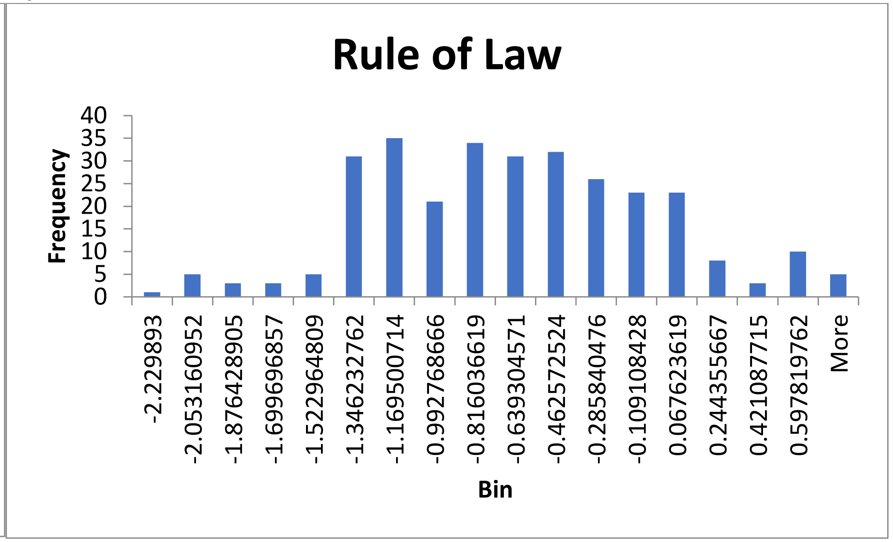
Appendix 5A and 5B: Summary Statistics without and with rescaling the institutional quality indices

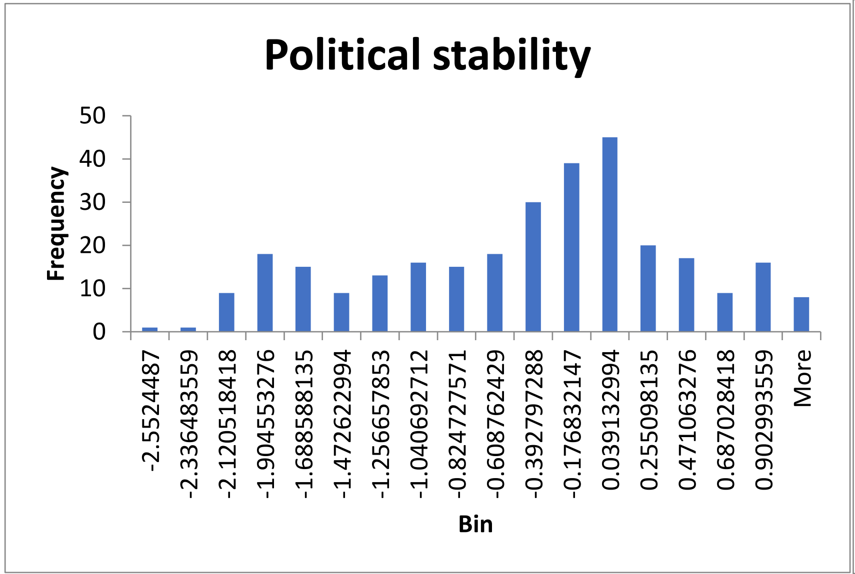
Variable		Mean	Std. Dev.	Min	Max
rule	overall	-.7245315	.6066962	-2.229893	.7745518
	between		.5796764	-1.463147	.4934208
	within		.2311023	-1.491278	-.1078835
goveff	overall	-.7974665	.4997752	-1.982009	.3934992
	between		.4778799	-1.514277	.1233492
	within		.18952	-1.265199	.0359999
corrupt	overall	-.633747	.480454	-1.740032	.9108245
	between		.4247715	-1.129877	.4024661
	within		.2487383	-1.797888	.334403
regqual	overall	-.6326315	.4380724	-2.112312	.1320623
	between		.4039219	-1.480774	-.1170205
	within		.1977931	-1.26417	-.0051658
politi~l	overall	-.5232592	.862678	-2.552449	1.118959
	between		.739285	-1.702632	.8649797
	within		.48208	-2.310269	.8081798
voice	overall	-.4778024	.6493816	-1.834272	.9703741
	between		.5975204	-1.178595	.8256176
	within		.2955559	-1.728669	.1596273
hdi	overall	.4120644	.0847515	.2281966	.6480781
	between		.0757143	.2915033	.5775889
	within		.0425962	.2907509	.495271
state	overall	13.28864	4.234255	3.541602	25.79397
	between		3.667695	8.53734	21.62633
	within		2.309056	4.984806	20.92032
estate	overall	1.92e+09	5.02e+09	2.78e+07	3.36e+10
	between		3.87e+09	6.83e+07	1.55e+10
	within		3.34e+09	-1.21e+10	2.00e+10
fdig	overall	5.266352	10.0018	.0115147	85.96305
	between		7.669564	1.321734	32.26554
	within		6.704598	-26.50097	58.96386
fdit	overall	512.043	1291.065	.1048147	8914.89
	between		1057.98	11.67003	4175.769
	within		786.546	-2486.018	5251.164
fditt	overall	512043	1291065	104.8147	8914890
	between		1057980	11670.03	4175769
	within		786546	-2486018	5251164
regtrade	overall	6.8314	6.705799	0	34.53811
	between		4.744446	0	13.52229
	within		4.887572	-6.303777	28.93366
exports	overall	441328.6	981513.2	-7094.021	6106598
	between		774294.9	-825.3395	2664961
	within		633981.8	-1684936	5775173
imports	overall	355270	511603.9	-1619907	3181828
	between		380468.3	0	1416753
	within		355219.6	-1546541	2278831
ecowas	overall	796598.7	1286109	0	7261022
	between		1013345	0	3197234
	within		832141.7	-1568040	6685072

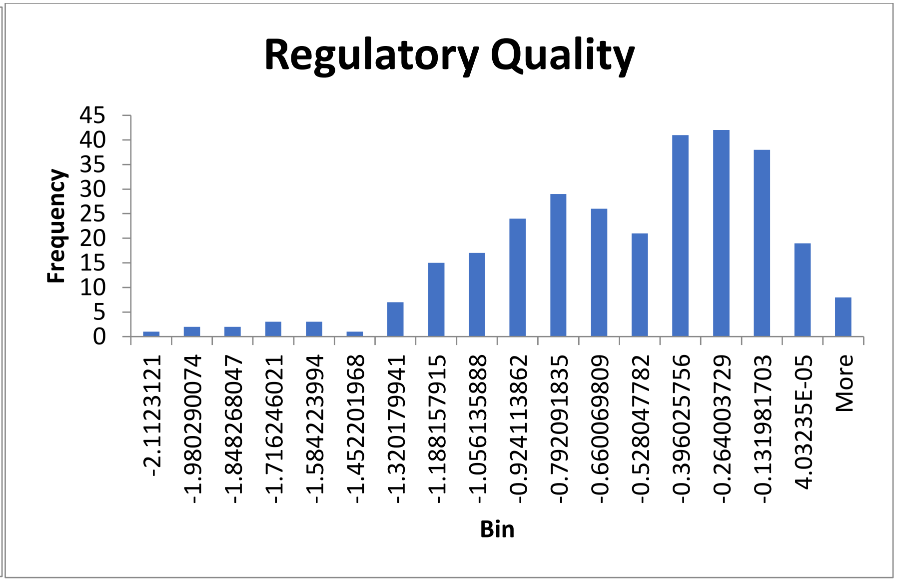
	Mean	Std. Dev.	Min	Max	Observations	
overall	19.27467	.6079943	17.8	20.8	N =	300
between		.5807645	18.535	20.495	n =	15
within		.2319541	18.53967	19.93967	T =	20
overall	19.20033	.5008687	18	20.4	N =	300
between		.4777345	18.49	20.13	n =	15
within		.192723	18.69533	19.99533	T =	20
overall	19.369	.4828209	18.3	20.9	N =	300
between		.427435	18.865	20.41	n =	15
within		.2490483	18.159	20.344	T =	20
overall	19.36733	.437918	17.9	20.1	N =	300
between		.4034975	18.52	19.885	n =	15
within		.1982616	18.74733	19.94733	T =	20
overall	19.474	.8647253	17.4	21.1	N =	300
between		.7402225	18.3	20.87	n =	15
within		.4843953	17.714	20.804	T =	20
overall	19.52267	.6526146	18.2	21	N =	300
between		.5992163	18.82	20.83	n =	15
within		.2994365	18.30767	20.14767	T =	20
overall	.4119333	.0847676	.23	.65	N =	300
between		.075658	.291	.5785	n =	15
within		.0427218	.2899333	.4984333	T =	20
overall	13.28863	4.234093	3.54	25.79	N =	300
between		3.667422	8.5375	21.625	n =	15
within		2.309165	4.983133	20.92313	T =	20
overall	1.92e+09	5.02e+09	2.78e+07	3.36e+10	N =	300
between		3.87e+09	6.83e+07	1.55e+10	n =	15
within		3.34e+09	-1.21e+10	2.00e+10	T =	20
overall	5.267	10.00203	0	86	N =	300
between		7.66834	1.325	32.26	n =	15
within		6.70626	-26.493	59.007	T =	20
overall	512.0437	1291.066	.1	8914.9	N =	300
between		1057.982	11.665	4175.775	n =	15
within		786.5447	-2486.031	5251.169	T =	20
overall	6.827	6.706955	0	34.5	N =	300
between		4.747573	0	13.52	n =	15
within		4.886315	-6.293	28.892	T =	20
overall	441328.6	981513.2	-7094	6106598	N =	300
between		774294.9	-825.34	2664961	n =	15
within		633981.8	-1684936	5775173	T =	20
overall	355270	511603.9	-1619907	3181828	N =	300
between		380468.3	0	1416753	n =	15
within		355219.6	-1546541	2278831	T =	20
overall	796598.7	1286109	0	7261022	N =	300
between		1013345	0	3197234	n =	15
within		832141.7	-1568040	6685072	T =	20

Appendix 5C: Frequency Distribution of the Dataset- Normality observation of the IQ indicators

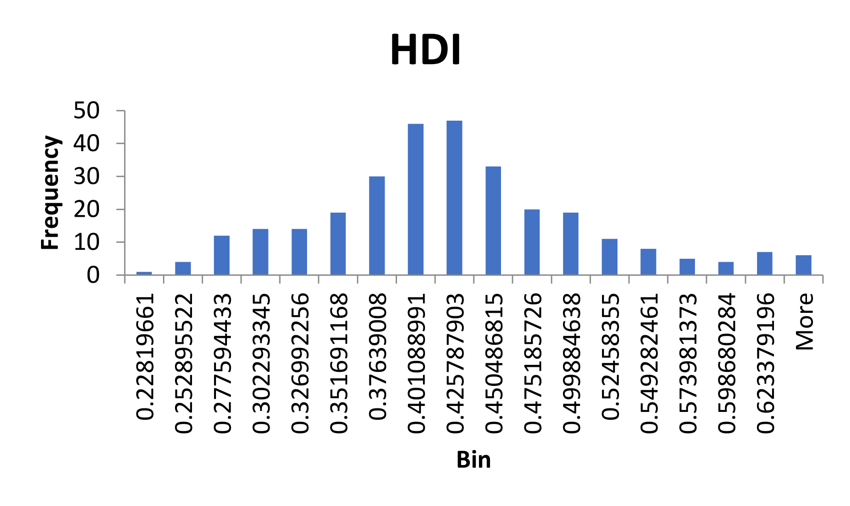


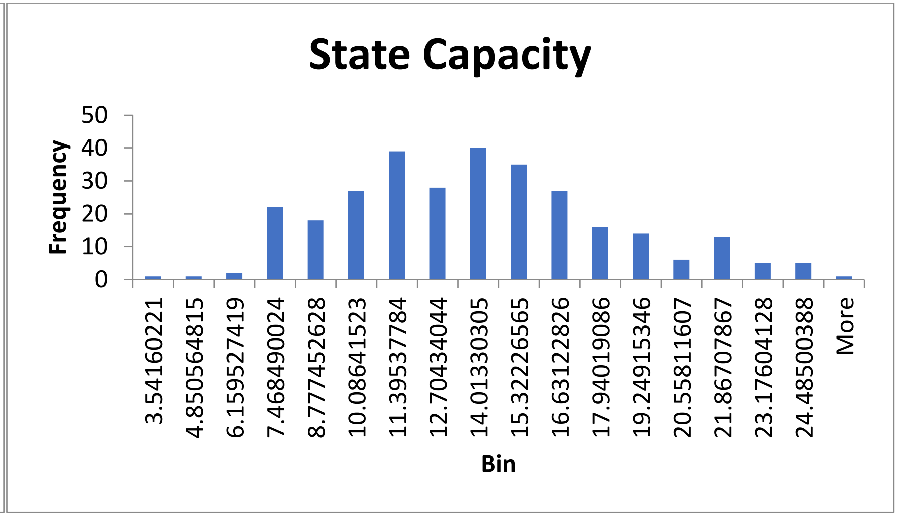


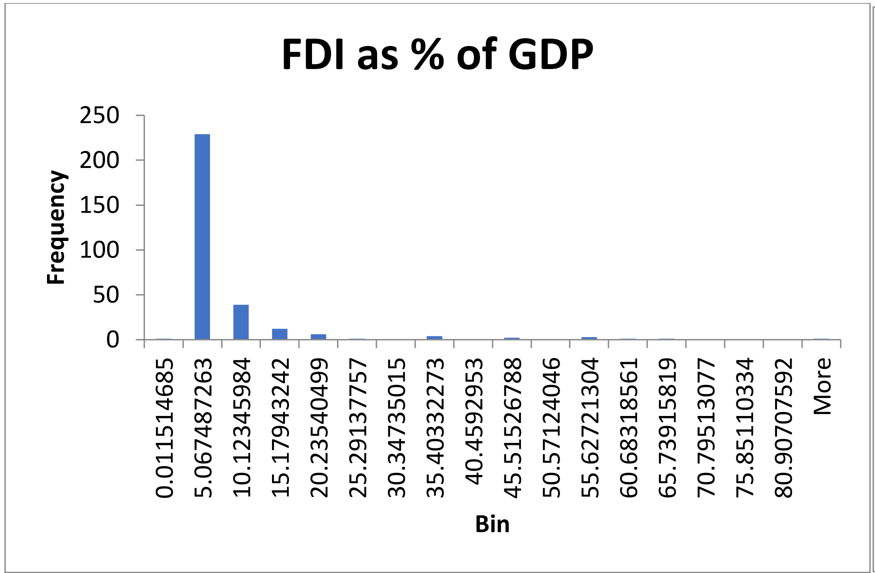


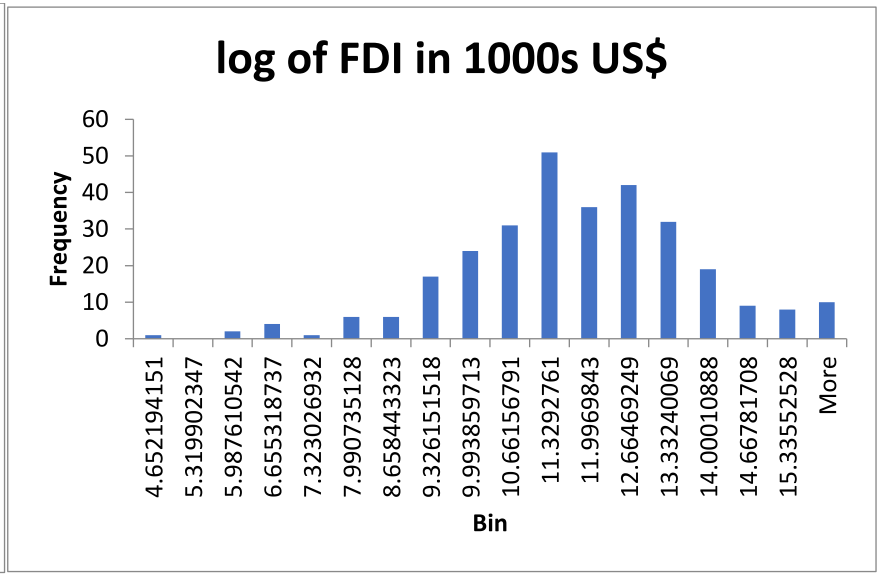


Appendix 5C1: The Frequency Distribution of the Dataset- Normality observation of the independent variables









Appendix 5D: Summary statistics: Detailed data observation- institutional quality indices

	Control of Corruption	*Government Effectiveness*	*Political Stability and Absence of Violence/Terrorism*	*Regulatory Quality*	*Rule of Law*	*Voice and Accountability*
Mean	-0.63	-0.80	-0.52	-0.63	-0.72	-0.48
Standard Error	0.03	0.03	0.05	0.03	0.04	0.04
Median	-0.69	-0.82	-0.34	-0.55	-0.74	-0.43
Mode	-0.44	-1.24	N/A	N/A	N/A	N/A
Standard Deviation	0.48	0.50	0.86	0.44	0.61	0.65
Sample Variance	0.23	0.25	0.74	0.19	0.37	0.42
Kurtosis	1.16	-0.56	-0.66	0.44	-0.27	-0.73
Skewness	0.86	0.24	-0.37	-0.76	0.11	0.29
Range	2.65	2.38	3.67	2.24	3.00	2.80
Minimum	-1.74	-1.98	-2.50	-2.11	-2.23	-1.83
Maximum	0.91	0.39	1.12	0.13	0.77	0.97
Sum	-190.12	-239.24	-156.98	-189.79	-217.36	-143.34
Count	300	300	300	300	300	300
Confidence Level (95.0%)	0.055	0.057	0.098	0.050	0.069	0.074

Appendix 5D1: Summary statistics: Detailed data observation independent variables

	hdi	*regtrade*	State	*logFDI*
Mean	0.41	6.83	13.29	11.48
Standard Error	0.00	0.39	0.24	0.11
Median	0.41	5.12	13.09	11.52
Mode	N/A	0.00	N/A	8.39
Standard Deviation	0.08	6.71	4.23	1.96
Sample Variance	0.01	44.97	17.93	3.83
Kurtosis	0.35	1.83	-0.13	0.56
Skewness	0.46	1.36	0.45	-0.28
Range	0.42	34.54	22.25	11.35
Minimum	0.23	0.00	3.54	4.65
Maximum	0.65	34.54	25.79	16.00
Sum	123.62	2049.42	3986.59	3442.63
Count	300	300	300	300
Confidence Level (95.0%)	0.010	0.762	0.481	0.222

Appendix 5E: Correlation Test

	hdi	*state*	*fdig*	*fditt*	*regtrade*	*exports*	*imports*	*ecowas*	*corrupt*	*goveff*	*political*	*regqual*	*rule*	*voice*
hdi	1													
state	0.091	1												
estate	0.288	-0.151												
fdig	0.074	-0.045	1											
fdit	0.352	-0.159	0.025627											
fditt	0.352	-0.159	0.025627	1										
regtrade	-0.07	-0.035	-0.15517	-0.15328	1									
exports	0.293	-0.141	-0.11669	0.730306	0.094977	1								
imports	0.064	0.1333	-0.15184	0.118474	0.519338	0.427136	1							
ecowas	0.249	-0.055	-0.14945	0.604472	0.279072	0.933076	0.723767	1						
corrupt	0.403	0.5146	-0.09566	-0.12892	-0.24723	-0.15234	-0.01467	-0.1221	1					
goveff	0.432	0.4254	-0.22613	-0.02298	-0.23264	-0.03587	0.040874	-0.01112	0.799518	1				
political	0.242	0.448	-0.11887	-0.31698	0.014984	-0.3584	-0.15267	-0.33425	0.611569	0.637665	1			
regqual	0.311	0.4775	-0.32469	0.013892	-0.04341	0.019403	0.165456	0.080625	0.754245	0.832758	0.654935	1		
rule	0.417	0.4871	-0.14697	-0.09015	-0.11712	-0.12647	0.014924	-0.09058	0.814089	0.870375	0.790797	0.830083	1	
voice	0.454	0.5361	-0.01057	-0.00282	-0.1415	-0.07493	0.054065	-0.03568	0.692123	0.735539	0.637208	0.623881	0.766212	1

Appendix 5F: Wooldridge Autocorrelation Test

```
. xtserial  lregq regim regin lhdi lstate  lfdit  lestate lfdig lregtrade limport lecowas  lexport zone

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      13) =    102.356
           Prob > F =      0.0000

. xtserial  lcorrupt  corruptin corruptim lhdi lstate  lfdit  lestate lfdig lregtrade limport lecowas  lexport zone

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      13) =     30.647
           Prob > F =      0.0001

. xtserial   lgoveff goveffin lhdi lstate  lfdit  lestate lfdig lregtrade limport lecowas  lexport zone

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      13) =     26.574
           Prob > F =      0.0002

. xtserial   lrule rulein ruleimm lhdi lstate  lfdit  lestate lfdig lregtrade limport lecowas  lexport zone

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      13) =     33.251
           Prob > F =      0.0001

. xtserial  lpolitical politicalin politicalim lhdi lstate  lfdit  lestate lfdig lregtrade limport lecowas  lexport zone

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      13) =     43.068
           Prob > F =      0.0000

. xtserial  lvoice voicein voiceimm lhdi lstate  lfdit  lestate lfdig lregtrade limport lecowas  lexport zone

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      13) =     64.616
           Prob > F =      0.0000
```

Appendix 5G: Wooldridge Autocorrelation test after using generalised least square regression

```
. predict yhat
(20 missing values generated)

. predict res
(20 missing values generated)

. xtserial res regin regim lhdi lstate lfdig lregtrade zone

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      13) =      0.373
           Prob > F =      0.5522
```

```
. predict yhat
(20 missing values generated)

. predict res
(20 missing values generated)

. xtserial res rulein ruleimm lhdi lstate lfdig lregtrade zone

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      13) =      0.480
           Prob > F =      0.5006
```

```
. predict yhat
(20 missing values generated)

. predict res
(20 missing values generated)

. xtserial res voicein voiceimm lhdi lstate lfdig lregtrade zone

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      13) =      0.050
           Prob > F =      0.8258
```

```
. predict yhat
(20 missing values generated)

. predict res
(20 missing values generated)

. xtserial res politicalin politicalim lhdi lstate lfdig lregtrade zone

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      13) =      0.226
           Prob > F =      0.6422
```

```
. xtserial res corruptin corruptim lhdi lstate lfdig lregtrade zone

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      13) =      0.058
           Prob > F =      0.8131
```

Where regin= regulatory quality autocorrelation test; corruption= corruption perception index test; rulein= rule of law autocorrelation test; politicalin=political stability autocorrelation test; voicein= voice and accountability autocorrelation test.

Appendix 5H: Unitroot root and test for convergence

Appendix 5H1: Regulatory quality unit root test using LLC (Levin-Lin and Chu)

```
. xtunitroot llc lregq

Levin-Lin-Chu unit-root test for lregq

Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                   Statistic      p-value

 Unadjusted t       -7.5641
 Adjusted t*        -3.3904        0.0003
```

```
. xtunitroot llc lregq, demean

Levin-Lin-Chu unit-root test for lregq

Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included                  Cross-sectional means removed

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                   Statistic      p-value

 Unadjusted t       -6.9781
 Adjusted t*        -2.7994        0.0026
```

```
. xtunitroot llc  lregq,demean trend

Levin-Lin-Chu unit-root test for lregq

Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included                      Cross-sectional means removed

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                   Statistic      p-value

 Unadjusted t       -9.3647
 Adjusted t*        -2.2679        0.0117
```

```
. xtunitroot llc  lregq,trend

Levin-Lin-Chu unit-root test for lregq

Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                   Statistic      p-value

 Unadjusted t       -8.9957
 Adjusted t*        -1.6755        0.0469
```

```
. xtunitroot llc  lregq, lags(aic 4)

Levin-Lin-Chu unit-root test for lregq

Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 0.93 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                   Statistic      p-value

 Unadjusted t       -8.1190
 Adjusted t*        -4.1664        0.0000
```

```
. xtunitroot llc  lregq,trend lags(aic 10)

Levin-Lin-Chu unit-root test for lregq

Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 4.07 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                   Statistic      p-value

 Unadjusted t       -7.3813
 Adjusted t*         4.8347        1.0000
```

```
. xtunitroot llc  lregq,trend demean lags(aic 4)

Levin-Lin-Chu unit-root test for lregq

Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included                      Cross-sectional means removed

ADF regressions: 1.20 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                   Statistic      p-value

 Unadjusted t       -9.6800
 Adjusted t*        -2.8331        0.0023
```

```
. xtunitroot llc  lregq if numbcountry==4

Levin-Lin-Chu unit-root test for lregq
---------------------------------------
Ho: Panels contain unit roots                 Number of panels  =      1
Ha: Panels are stationary                     Number of periods =     20

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -4.3136
 Adjusted t*         -1.8023        0.0357
------------------------------------------------------------------------------

. xtunitroot llc  lregq if numbcountry==5

Levin-Lin-Chu unit-root test for lregq
---------------------------------------
Ho: Panels contain unit roots                 Number of panels  =      1
Ha: Panels are stationary                     Number of periods =     20

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -1.6068
 Adjusted t*         -0.7349        0.2312
------------------------------------------------------------------------------

. xtunitroot llc  lregq if numbcountry==6

Levin-Lin-Chu unit-root test for lregq
---------------------------------------
Ho: Panels contain unit roots                 Number of panels  =      1
Ha: Panels are stationary                     Number of periods =     20

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -2.2022
 Adjusted t*         -1.0144        0.1552
------------------------------------------------------------------------------
```

```
. xtunitroot llc  lregq if numbcountry==7

Levin-Lin-Chu unit-root test for lregq
---------------------------------------
Ho: Panels contain unit roots                 Number of panels  =      1
Ha: Panels are stationary                     Number of periods =     20

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -3.5672
 Adjusted t*         -1.8572        0.0316
------------------------------------------------------------------------------

. xtunitroot llc lregq if numbcountry==8

Levin-Lin-Chu unit-root test for lregq
---------------------------------------
Ho: Panels contain unit roots                 Number of panels  =      1
Ha: Panels are stationary                     Number of periods =     20

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -2.0496
 Adjusted t*         -0.6455        0.2593
------------------------------------------------------------------------------

. xtunitroot llc lregq if numbcountry==9

Levin-Lin-Chu unit-root test for lregq
---------------------------------------
Ho: Panels contain unit roots                 Number of panels  =      1
Ha: Panels are stationary                     Number of periods =     20

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -0.5521
 Adjusted t*         -0.1276        0.4492
```

```
. xtunitroot llc  lregq if numbcountry==13

Levin-Lin-Chu unit-root test for lregq
--------------------------------------
Ho: Panels contain unit roots                 Number of panels  =      1
Ha: Panels are stationary                     Number of periods =     20

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -2.1428
 Adjusted t*         -0.8622        0.1943
------------------------------------------------------------------------------

. xtunitroot llc  lregq if numbcountry==14

Levin-Lin-Chu unit-root test for lregq
--------------------------------------
Ho: Panels contain unit roots                 Number of panels  =      1
Ha: Panels are stationary                     Number of periods =     20

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -1.5521
 Adjusted t*         -0.9029        0.1833
------------------------------------------------------------------------------

. xtunitroot llc  lregq if numbcountry==15

Levin-Lin-Chu unit-root test for lregq
--------------------------------------
Ho: Panels contain unit roots                 Number of panels  =      1
Ha: Panels are stationary                     Number of periods =     20

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -2.9797
 Adjusted t*         -2.0648        0.0195
------------------------------------------------------------------------------
```

Appendix 5H2: Regulatory quality unit root test using Harris Tzavalis

```
. xtunitroot ht lregq

Harris-Tzavalis unit-root test for lregq
----------------------------------------
Ho: Panels contain unit roots                  Number of panels  =     15
Ha: Panels are stationary                      Number of periods =     20

AR parameter: Common                           Asymptotics: N -> Infinity
Panel means:  Included                                      T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                     Statistic           z            p-value
------------------------------------------------------------------------------
 rho                   0.8044         -1.3803          0.0837
------------------------------------------------------------------------------

. xtunitroot ht lregq, demean

Harris-Tzavalis unit-root test for lregq
----------------------------------------
Ho: Panels contain unit roots                  Number of panels  =     15
Ha: Panels are stationary                      Number of periods =     20

AR parameter: Common                           Asymptotics: N -> Infinity
Panel means:  Included                                      T Fixed
Time trend:   Not included                     Cross-sectional means removed
------------------------------------------------------------------------------
                     Statistic           z            p-value
------------------------------------------------------------------------------
 rho                   0.8098         -1.2386          0.1078
------------------------------------------------------------------------------

. xtunitroot ht  lregq,demean trend

Harris-Tzavalis unit-root test for lregq
----------------------------------------
Ho: Panels contain unit roots                  Number of panels  =     15
Ha: Panels are stationary                      Number of periods =     20

AR parameter: Common                           Asymptotics: N -> Infinity
Panel means:  Included                                      T Fixed
Time trend:   Included                         Cross-sectional means removed
------------------------------------------------------------------------------
                     Statistic           z            p-value
------------------------------------------------------------------------------
 rho                   0.6191         -0.7335          0.2316
------------------------------------------------------------------------------

. xtunitroot ht  lregq,trend

Harris-Tzavalis unit-root test for lregq
----------------------------------------
Ho: Panels contain unit roots                  Number of panels  =     15
Ha: Panels are stationary                      Number of periods =     20

AR parameter: Common                           Asymptotics: N -> Infinity
Panel means:  Included                                      T Fixed
Time trend:   Included
------------------------------------------------------------------------------
                     Statistic           z            p-value
------------------------------------------------------------------------------
 rho                   0.6428         -0.2985          0.3827
------------------------------------------------------------------------------
```

```
. xtunitroot ht  lregq if numbcountry==4

Harris-Tzavalis unit-root test for lregq
----------------------------------------
Ho: Panels contain unit roots                  Number of panels  =      1
Ha: Panels are stationary                      Number of periods =     20

AR parameter: Common                           Asymptotics: N -> Infinity
Panel means:  Included                                      T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                     Statistic           z            p-value
------------------------------------------------------------------------------
 rho                   0.4278         -2.9027          0.0018
------------------------------------------------------------------------------

. xtunitroot ht lregq if numbcountry==5

Harris-Tzavalis unit-root test for lregq
----------------------------------------
Ho: Panels contain unit roots                  Number of panels  =      1
Ha: Panels are stationary                      Number of periods =     20

AR parameter: Common                           Asymptotics: N -> Infinity
Panel means:  Included                                      T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                     Statistic           z            p-value
------------------------------------------------------------------------------
 rho                   0.7884         -0.4645          0.3211
------------------------------------------------------------------------------

. xtunitroot ht lregq if numbcountry==6

Harris-Tzavalis unit-root test for lregq
----------------------------------------
Ho: Panels contain unit roots                  Number of panels  =      1
Ha: Panels are stationary                      Number of periods =     20

AR parameter: Common                           Asymptotics: N -> Infinity
Panel means:  Included                                      T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                     Statistic           z            p-value
------------------------------------------------------------------------------
 rho                   0.8730          0.1074          0.5428
```

```
. xtunitroot ht  lregq if numbcountry==7

Harris-Tzavalis unit-root test for lregq
----------------------------------------
Ho: Panels contain unit roots               Number of panels  =      1
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                    Statistic         z          p-value
------------------------------------------------------------------------------
 rho                  0.3927       -3.1396        0.0008
------------------------------------------------------------------------------

. xtunitroot ht  lregq if numbcountry==8

Harris-Tzavalis unit-root test for lregq
----------------------------------------
Ho: Panels contain unit roots               Number of panels  =      1
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                    Statistic         z          p-value
------------------------------------------------------------------------------
 rho                  0.8479       -0.0625        0.4751
------------------------------------------------------------------------------

. xtunitroot ht lregq if numbcountry==9

Harris-Tzavalis unit-root test for lregq
----------------------------------------
Ho: Panels contain unit roots               Number of panels  =      1
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                    Statistic         z          p-value
------------------------------------------------------------------------------
 rho                  0.9702        0.7640        0.7776
------------------------------------------------------------------------------
```

Appendix 5H3: Regulatory quality unit root test using breitung

```
. xtunitroot breitung lregq,trend robust

Breitung unit-root test for lregq

Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Included                  Prewhitening: Not performed

                   Statistic      p-value

 lambda*            0.5157        0.6970

 * Lambda robust to cross-sectional correlation

. xtunitroot breitung lregq, demean

Breitung unit-root test for lregq

Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Not included              Prewhitening: Not performed
                                        Cross-sectional means removed

                   Statistic      p-value

 lambda            -0.0554        0.4779
```

```
. xtunitroot breitung lregq,demean trend

Breitung unit-root test for lregq

Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Included                  Prewhitening: Not performed
                                        Cross-sectional means removed

                   Statistic      p-value

 lambda             1.3919        0.9180

. xtunitroot breitung lregq,trend

Breitung unit-root test for lregq

Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Included                  Prewhitening: Not performed

                   Statistic      p-value

 lambda             1.3120        0.9052

. xtunitroot breitung lregq

Breitung unit-root test for lregq

Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Not included              Prewhitening: Not performed

                   Statistic      p-value

 lambda            -0.2999        0.3821
```

```
. xtunitroot breitung lregq if numbcountry==9, robust

Breitung unit-root test for lregq
---------------------------------
Ho: Panels contain unit roots            Number of panels  =      1
Ha: Panels are stationary                Number of periods =     20

AR parameter: Common                     Asymptotics:  T,N -> Infinity
Panel means:  Included                                    sequentially
Time trend:   Not included               Prewhitening: Not performed
------------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------------
 lambda*              1.1743       0.8799
------------------------------------------------------------------------------
 * Lambda robust to cross-sectional correlation

. xtunitroot breitung lregq if numbcountry==9,trend

Breitung unit-root test for lregq
---------------------------------
Ho: Panels contain unit roots            Number of panels  =      1
Ha: Panels are stationary                Number of periods =     20

AR parameter: Common                     Asymptotics:  T,N -> Infinity
Panel means:  Included                                    sequentially
Time trend:   Included                   Prewhitening: Not performed
------------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------------
 lambda              -1.4683       0.0710
------------------------------------------------------------------------------

. xtunitroot breitung lregq if numbcountry==10, robust

Breitung unit-root test for lregq
---------------------------------
Ho: Panels contain unit roots            Number of panels  =      1
Ha: Panels are stationary                Number of periods =     20

AR parameter: Common                     Asymptotics:  T,N -> Infinity
Panel means:  Included                                    sequentially
Time trend:   Not included               Prewhitening: Not performed
------------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------------
 lambda*             -1.3182       0.0937
------------------------------------------------------------------------------
 * Lambda robust to cross-sectional correlation

. xtunitroot breitung lregq if numbcountry==10,trend

Breitung unit-root test for lregq
---------------------------------
Ho: Panels contain unit roots            Number of panels  =      1
Ha: Panels are stationary                Number of periods =     20

AR parameter: Common                     Asymptotics:  T,N -> Infinity
Panel means:  Included                                    sequentially
Time trend:   Included                   Prewhitening: Not performed
------------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------------
 lambda              -0.4003       0.3445
```

```
. xtunitroot breitung lregq if numbcountry==15, robust

Breitung unit-root test for lregq
---------------------------------
Ho: Panels contain unit roots            Number of panels  =      1
Ha: Panels are stationary                Number of periods =     20

AR parameter: Common                     Asymptotics:  T,N -> Infinity
Panel means:  Included                                    sequentially
Time trend:   Not included               Prewhitening: Not performed
------------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------------
 lambda*              0.2809       0.6106
------------------------------------------------------------------------------
 * Lambda robust to cross-sectional correlation

. xtunitroot breitung lregq if numbcountry==15,trend

Breitung unit-root test for lregq
---------------------------------
Ho: Panels contain unit roots            Number of panels  =      1
Ha: Panels are stationary                Number of periods =     20

AR parameter: Common                     Asymptotics:  T,N -> Infinity
Panel means:  Included                                    sequentially
Time trend:   Included                   Prewhitening: Not performed
------------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------------
 lambda               0.7729       0.7802
```

Appendix 5H4: Regulatory quality unit root test using IM PEARSON SHIN

```
. xtunitroot ips lregq

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots             Number of panels  =     15
Ha: Some panels are stationary                Number of periods =     20

AR parameter: Panel-specific                  Asymptotics: T,N -> Infinity
Panel means:  Included                                       sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                 Statistic      p-value          1%        5%       10%
------------------------------------------------------------------------------
 t-bar            -2.1827                      -2.080    -1.910    -1.820
 t-tilde-bar      -1.8485
 Z-t-tilde-bar    -2.2827        0.0112
------------------------------------------------------------------------------
```

```
. xtunitroot ips lregq, demean

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots             Number of panels  =     15
Ha: Some panels are stationary                Number of periods =     20

AR parameter: Panel-specific                  Asymptotics: T,N -> Infinity
Panel means:  Included                                       sequentially
Time trend:   Not included                    Cross-sectional means removed

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                 Statistic      p-value          1%        5%       10%
------------------------------------------------------------------------------
 t-bar            -2.1864                      -2.080    -1.910    -1.820
 t-tilde-bar      -1.8570
 Z-t-tilde-bar    -2.3256        0.0100
------------------------------------------------------------------------------
```

```
. xtunitroot ips  lregq,demean trend

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots             Number of panels  =     15
Ha: Some panels are stationary                Number of periods =     20

AR parameter: Panel-specific                  Asymptotics: T,N -> Infinity
Panel means:  Included                                       sequentially
Time trend:   Included                        Cross-sectional means removed

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                 Statistic      p-value          1%        5%       10%
------------------------------------------------------------------------------
 t-bar            -2.2688                      -2.710    -2.550    -2.460
 t-tilde-bar      -1.8513
 Z-t-tilde-bar    -2.2969        0.0108
------------------------------------------------------------------------------
```

```
. xtunitroot ips  lregq,trend

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots             Number of panels  =     15
Ha: Some panels are stationary                Number of periods =     20

AR parameter: Panel-specific                  Asymptotics: T,N -> Infinity
Panel means:  Included                                       sequentially
Time trend:   Included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                 Statistic      p-value          1%        5%       10%
------------------------------------------------------------------------------
 t-bar            -2.0206                      -2.710    -2.550    -2.460
 t-tilde-bar      -1.7212
 Z-t-tilde-bar    -1.6422        0.0503
```

```
. xtunitroot ips  lregq, lags(4)

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                    sequentially
Time trend:   Not included

ADF regressions: 4 lags
------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------
 W-t-bar            -1.4333        0.0759
------------------------------------------------------------------------

. xtunitroot ips  lregq,trend lags(4)

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                    sequentially
Time trend:   Included

ADF regressions: 4 lags
------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------
 W-t-bar             0.5569        0.7112
------------------------------------------------------------------------

. xtunitroot ips  lregq,trend demean lags(4)

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                    sequentially
Time trend:   Included                      Cross-sectional means removed

ADF regressions: 4 lags
------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------
 W-t-bar             2.0687        0.9807
------------------------------------------------------------------------
```

```
. xtunitroot ips  lregq if numbcountry==3

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                    sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                   Statistic      p-value         1%       5%       10%
------------------------------------------------------------------------------
 t-bar              -2.9947                    -2.500   -2.190   -2.040
 t-tilde-bar        -2.4932
 Z-t-tilde-bar      -1.4274        0.0767
------------------------------------------------------------------------------

. xtunitroot ips  lregq if numbcountry==3,trend

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                    sequentially
Time trend:   Included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                   Statistic      p-value         1%       5%       10%
------------------------------------------------------------------------------
 t-bar              -2.0551                    -3.130   -2.820   -2.670
 t-tilde-bar        -1.7530
 Z-t-tilde-bar      -0.4653        0.3209
------------------------------------------------------------------------------
```

```
. xtunitroot ips  lregq if numbcountry==4

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                  Statistic      p-value          1%        5%        10%
------------------------------------------------------------------------------
 t-bar             -4.8016                      -2.500    -2.190    -2.040
 t-tilde-bar       -3.2188
 Z-t-tilde-bar     -2.3703        0.0089
------------------------------------------------------------------------------

. xtunitroot ips lregq if numbcountry==4, trend

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                  Statistic      p-value          1%        5%        10%
------------------------------------------------------------------------------
 t-bar             -3.6971                      -3.130    -2.820    -2.670
 t-tilde-bar       -2.5504
 Z-t-tilde-bar     -1.5016        0.0666
------------------------------------------------------------------------------
```

```
. xtunitroot ips  lregq if numbcountry==7

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                  Statistic      p-value          1%        5%        10%
------------------------------------------------------------------------------
 t-bar             -3.3297                      -2.500    -2.190    -2.040
 t-tilde-bar       -2.6656
 Z-t-tilde-bar     -1.6514        0.0493
------------------------------------------------------------------------------

. xtunitroot ips  lregq if numbcountry==7,trend

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                  Statistic      p-value          1%        5%        10%
------------------------------------------------------------------------------
 t-bar             -3.1022                      -3.130    -2.820    -2.670
 t-tilde-bar       -2.5594
 Z-t-tilde-bar     -1.5133        0.0651
```

```
. xtunitroot ips lregq if numbcountry==9

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                      sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                 Statistic      p-value            1%        5%       10%
------------------------------------------------------------------------------
 t-bar             -0.4041                     -2.500    -2.190    -2.040
 t-tilde-bar       -0.4138
 Z-t-tilde-bar      1.2753        0.8989
------------------------------------------------------------------------------

. xtunitroot ips lregq if numbcountry==9, trend

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                      sequentially
Time trend:   Included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                 Statistic      p-value            1%        5%       10%
------------------------------------------------------------------------------
 t-bar             -3.4409                     -3.130    -2.820    -2.670
 t-tilde-bar       -2.7599
 Z-t-tilde-bar     -1.7739        0.0380
------------------------------------------------------------------------------
```

```
. xtunitroot ips  lregq if numbcountry==11

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                      sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                 Statistic      p-value            1%        5%       10%
------------------------------------------------------------------------------
 t-bar             -4.4545                     -2.500    -2.190    -2.040
 t-tilde-bar       -3.1136
 Z-t-tilde-bar     -2.2336        0.0128
------------------------------------------------------------------------------

. xtunitroot ips  lregq if numbcountry==11,trend

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                      sequentially
Time trend:   Included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                 Statistic      p-value            1%        5%       10%
------------------------------------------------------------------------------
 t-bar             -2.8366                     -3.130    -2.820    -2.670
 t-tilde-bar       -1.9437
 Z-t-tilde-bar     -0.7131        0.2379
------------------------------------------------------------------------------
```

```
. xtunitroot ips  lregq if numbcountry==14

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                       sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                   Statistic      p-value          1%       5%       10%
------------------------------------------------------------------------------
 t-bar              -2.1616                      -2.500   -2.190   -2.040
 t-tilde-bar        -1.9700
 Z-t-tilde-bar      -0.7473        0.2274
------------------------------------------------------------------------------

. xtunitroot ips  lregq if numbcountry==14,trend

Im-Pesaran-Shin unit-root test for lregq
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                       sequentially
Time trend:   Included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                   Statistic      p-value          1%       5%       10%
------------------------------------------------------------------------------
 t-bar              -1.3411                      -3.130   -2.820   -2.670
 t-tilde-bar        -1.2380
 Z-t-tilde-bar       0.2040        0.5808
------------------------------------------------------------------------------
```

Appendix 5H5: Regulatory quality unit root test using FISHER

```
. xtunitroot fisher  lregq, dfuller lags(1)

Fisher-type unit-root test for lregq
Based on augmented Dickey-Fuller tests
------------------------------------------------
Ho: All panels contain unit roots              Number of panels  =     15
Ha: At least one panel is stationary           Number of periods =     20

AR parameter: Panel-specific                   Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Not included
Drift term:   Not included                     ADF regressions: 1 lag
------------------------------------------------------------------------------
                                  Statistic      p-value
------------------------------------------------------------------------------
 Inverse chi-squared(30)   P         57.9694       0.0016
 Inverse normal            Z         -3.0645       0.0011
 Inverse logit t(79)       L*        -3.1745       0.0011
 Modified inv. chi-squared Pm         3.6108       0.0002
------------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
------------------------------------------------------------------------------
```

```
. xtunitroot fisher  lregq, dfuller lags(1) demean trend

Fisher-type unit-root test for lregq
Based on augmented Dickey-Fuller tests
------------------------------------------------
Ho: All panels contain unit roots              Number of panels  =     15
Ha: At least one panel is stationary           Number of periods =     20

AR parameter: Panel-specific                   Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Included                         Cross-sectional means removed
Drift term:   Not included                     ADF regressions: 1 lag
------------------------------------------------------------------------------
                                  Statistic      p-value
------------------------------------------------------------------------------
 Inverse chi-squared(30)   P         48.0835       0.0194
 Inverse normal            Z         -0.8022       0.2112
 Inverse logit t(79)       L*        -1.0690       0.1442
 Modified inv. chi-squared Pm         2.3346       0.0098
------------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
------------------------------------------------------------------------------
```

```
. xtunitroot fisher  lregq, dfuller lags(7) trend

Fisher-type unit-root test for lregq
Based on augmented Dickey-Fuller tests
------------------------------------------------
Ho: All panels contain unit roots              Number of panels  =     15
Ha: At least one panel is stationary           Number of periods =     20

AR parameter: Panel-specific                   Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Included
Drift term:   Not included                     ADF regressions: 7 lags
------------------------------------------------------------------------------
                                  Statistic      p-value
------------------------------------------------------------------------------
 Inverse chi-squared(30)   P         86.1115       0.0000
 Inverse normal            Z          0.6478       0.7414
 Inverse logit t(69)       L*        -2.2239       0.0147
 Modified inv. chi-squared Pm         7.2440       0.0000
------------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
```

```
. xtunitroot fisher  lregq, dfuller lags(1) demean

Fisher-type unit-root test for lregq
Based on augmented Dickey-Fuller tests
------------------------------------------------
Ho: All panels contain unit roots              Number of panels  =     15
Ha: At least one panel is stationary           Number of periods =     20

AR parameter: Panel-specific                   Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Not included                     Cross-sectional means removed
Drift term:   Not included                     ADF regressions: 1 lag
------------------------------------------------------------------------------
                                  Statistic      p-value
------------------------------------------------------------------------------
 Inverse chi-squared(30)   P         52.7549       0.0063
 Inverse normal            Z         -2.2787       0.0113
 Inverse logit t(79)       L*        -2.5363       0.0066
 Modified inv. chi-squared Pm         2.9376       0.0017
------------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
```

Appendix 5H6: Regulatory quality unit root test using HADRI LM

```
. xtunitroot hadri  lregq, kernel(bartlett 4)

Hadri LM test for lregq
-------------------------
Ho: All panels are stationary               Number of panels  =     15
Ha: Some panels contain unit roots          Number of periods =     20

Time trend:         Not included            Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                    sequentially
LR variance:        Bartlett kernel, 4 lags
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                    6.4248        0.0000
------------------------------------------------------------------------------

. xtunitroot hadri  lregq, kernel(bartlett 4) trend

Hadri LM test for lregq
-------------------------
Ho: All panels are stationary               Number of panels  =     15
Ha: Some panels contain unit roots          Number of periods =     20

Time trend:         Included                Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                    sequentially
LR variance:        Bartlett kernel, 4 lags
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                    5.1632        0.0000
------------------------------------------------------------------------------
```

Appendix 5H7: Corruption Perception unit root test using LLC (Levin-Lin and Chu)

```
. xtunitroot llc lcorrupt

Levin-Lin-Chu unit-root test for lcorrupt
------------------------------------------
Ho: Panels contain unit roots                Number of panels  =     15
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
-------------------------------------------------------------------------
                         Statistic      p-value
-------------------------------------------------------------------------
 Unadjusted t             -6.6069
 Adjusted t*              -2.8077        0.0025
-------------------------------------------------------------------------

. xtunitroot llc lcorrupt, demean

Levin-Lin-Chu unit-root test for lcorrupt
------------------------------------------
Ho: Panels contain unit roots                Number of panels  =     15
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included                   Cross-sectional means removed

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
-------------------------------------------------------------------------
                         Statistic      p-value
-------------------------------------------------------------------------
 Unadjusted t             -6.8306
 Adjusted t*              -2.9183        0.0018
-------------------------------------------------------------------------

. xtunitroot llc  lcorrupt,demean trend

Levin-Lin-Chu unit-root test for lcorrupt
------------------------------------------
Ho: Panels contain unit roots                Number of panels  =     15
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included                       Cross-sectional means removed

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
-------------------------------------------------------------------------
                         Statistic      p-value
-------------------------------------------------------------------------
 Unadjusted t             -6.4851
 Adjusted t*              -1.4635        0.0717
-------------------------------------------------------------------------

. xtunitroot llc  lcorrupt,trend

Levin-Lin-Chu unit-root test for lcorrupt
------------------------------------------
Ho: Panels contain unit roots                Number of panels  =     15
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
-------------------------------------------------------------------------
                         Statistic      p-value
-------------------------------------------------------------------------
 Unadjusted t             -7.0479
 Adjusted t*              -1.9027        0.0285
-------------------------------------------------------------------------

. xtunitroot llc  lcorrupt, lags(aic 4)

Levin-Lin-Chu unit-root test for lcorrupt
------------------------------------------
Ho: Panels contain unit roots                Number of panels  =     15
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 0.93 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
-------------------------------------------------------------------------
                         Statistic      p-value
-------------------------------------------------------------------------
 Unadjusted t             -7.5157
 Adjusted t*              -3.5203        0.0002
-------------------------------------------------------------------------

. xtunitroot llc  lcorrupt,trend lags(aic 10)

Levin-Lin-Chu unit-root test for lcorrupt
------------------------------------------
Ho: Panels contain unit roots                Number of panels  =     15
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 4.80 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
-------------------------------------------------------------------------
                         Statistic      p-value
-------------------------------------------------------------------------
 Unadjusted t             -5.6320
 Adjusted t*               2.6882        0.9964
-------------------------------------------------------------------------

. xtunitroot llc  lcorrupt,trend demean lags(aic 4)

Levin-Lin-Chu unit-root test for lcorrupt
------------------------------------------
Ho: Panels contain unit roots                Number of panels  =     15
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included                       Cross-sectional means removed

ADF regressions: 1.73 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
-------------------------------------------------------------------------
                         Statistic      p-value
-------------------------------------------------------------------------
 Unadjusted t             -6.8976
 Adjusted t*              -2.0958        0.0180
-------------------------------------------------------------------------
```

362

```
. xtunitroot llc lcorrupt if numbcountry==1

Levin-Lin-Chu unit-root test for lcorrupt
-----------------------------------------
Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------
                      Statistic       p-value
------------------------------------------------------------------------
 Unadjusted t          -3.9423
 Adjusted t*           -2.1711         0.0150
------------------------------------------------------------------------
```

```
. xtunitroot llc lcorrupt if numbcountry==2

Levin-Lin-Chu unit-root test for lcorrupt
-----------------------------------------
Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------
                      Statistic       p-value
------------------------------------------------------------------------
 Unadjusted t          -1.9248
 Adjusted t*           -0.9528         0.1704
------------------------------------------------------------------------
```

```
. xtunitroot llc  lcorrupt if numbcountry==3

Levin-Lin-Chu unit-root test for lcorrupt
-----------------------------------------
Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------
                      Statistic       p-value
------------------------------------------------------------------------
 Unadjusted t          -2.6930
 Adjusted t*           -1.8741         0.0305
------------------------------------------------------------------------
```

```
. xtunitroot llc  lcorrupt if numbcountry==7

Levin-Lin-Chu unit-root test for lcorrupt
-----------------------------------------
Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------
                      Statistic       p-value
------------------------------------------------------------------------
 Unadjusted t          -1.0018
 Adjusted t*            0.8674         0.8071
------------------------------------------------------------------------
```

```
. xtunitroot llc lcorrupt if numbcountry==8

Levin-Lin-Chu unit-root test for lcorrupt
-----------------------------------------
Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------
                      Statistic       p-value
------------------------------------------------------------------------
 Unadjusted t          -2.1109
 Adjusted t*           -0.0421         0.4832
------------------------------------------------------------------------
```

```
. xtunitroot llc lcorrupt if numbcountry==9

Levin-Lin-Chu unit-root test for lcorrupt
-----------------------------------------
Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------
                      Statistic       p-value
------------------------------------------------------------------------
 Unadjusted t          -1.7891
 Adjusted t*           -1.1842         0.1182
------------------------------------------------------------------------
```

Appendix 5H8: Corruption Perception unit root test using Harris Tzavalis

```
. xtunitroot ht lcorrupt

Harris-Tzavalis unit-root test for lcorrupt

Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Not included

                    Statistic        z         p-value

 rho               0.7937       -1.6612      0.0483
```

```
. xtunitroot ht lcorrupt, demean

Harris-Tzavalis unit-root test for lcorrupt

Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Not included                  Cross-sectional means remov

                    Statistic        z         p-value

 rho               0.7987       -1.5297      0.0630
```

```
. xtunitroot ht  lcorrupt,demean trend

Harris-Tzavalis unit-root test for lcorrupt

Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included                      Cross-sectional means remov

                    Statistic        z         p-value

 rho               0.7311        1.3216      0.9069
```

```
. xtunitroot ht  lcorrupt,trend

Harris-Tzavalis unit-root test for lcorrupt

Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included

                    Statistic        z         p-value

 rho               0.7206        1.1282      0.8704
```

```
. xtunitroot ht lcorrupt if numbcountry==1

Harris-Tzavalis unit-root test for lcorrupt

Ho: Panels contain unit roots               Number of panels  =      1
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Not included

                    Statistic        z         p-value

 rho               0.1610       -4.7061      0.0000
```

```
. xtunitroot ht lcorrupt if numbcountry==2

Harris-Tzavalis unit-root test for lcorrupt

Ho: Panels contain unit roots               Number of panels  =      1
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Not included

                    Statistic        z         p-value

 rho               0.7121       -0.9804      0.1635
```

```
. xtunitroot ht  lcorrupt if numbcountry==3

Harris-Tzavalis unit-root test for lcorrupt

Ho: Panels contain unit roots               Number of panels  =      1
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Not included

                    Statistic        z         p-value

 rho               0.8423       -0.1001      0.4601
```

```
. xtunitroot ht  lcorrupt if numbcountry==7

Harris-Tzavalis unit-root test for lcorrupt
-------------------------------------------
Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N -> Infinity
Panel means:  Included                                  T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                    Statistic        z         p-value
------------------------------------------------------------------------------
 rho                  0.8719       0.0996       0.5397
------------------------------------------------------------------------------

. xtunitroot ht  lcorrupt if numbcountry==8

Harris-Tzavalis unit-root test for lcorrupt
-------------------------------------------
Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N -> Infinity
Panel means:  Included                                  T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                    Statistic        z         p-value
------------------------------------------------------------------------------
 rho                  0.7852      -0.4861       0.3134
------------------------------------------------------------------------------

. xtunitroot ht lcorrupt if numbcountry==9

Harris-Tzavalis unit-root test for lcorrupt
-------------------------------------------
Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N -> Infinity
Panel means:  Included                                  T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                    Statistic        z         p-value
------------------------------------------------------------------------------
 rho                  0.8718       0.0989       0.5394
------------------------------------------------------------------------------
```

Appendix 5H9: Corruption Perception unit root test using breitung

```
. xtunitroot breitung lcorrupt,trend robust

Breitung unit-root test for lcorrupt
------------------------------------
Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                sequentially
Time trend:   Included                  Prewhitening: Not performed
------------------------------------------------------------------------------
                    Statistic       p-value
------------------------------------------------------------------------------
 lambda*              1.2978         0.9028
------------------------------------------------------------------------------
 * Lambda robust to cross-sectional correlation

. xtunitroot breitung lcorrupt , demean

Breitung unit-root test for lcorrupt
------------------------------------
Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                sequentially
Time trend:   Not included              Prewhitening: Not performed
                                        Cross-sectional means removed
------------------------------------------------------------------------------
                    Statistic       p-value
------------------------------------------------------------------------------
 lambda               0.4569         0.6761
------------------------------------------------------------------------------

. xtunitroot breitung lcorrupt,demean trend

Breitung unit-root test for lcorrupt
------------------------------------
Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                sequentially
Time trend:   Included                  Prewhitening: Not performed
                                        Cross-sectional means removed
------------------------------------------------------------------------------
                    Statistic       p-value
------------------------------------------------------------------------------
 lambda               1.7116         0.9565
------------------------------------------------------------------------------
```

```
. xtunitroot breitung lcorrupt,trend

Breitung unit-root test for lcorrupt
------------------------------------
Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                sequentially
Time trend:   Included                  Prewhitening: Not performed
------------------------------------------------------------------------------
                    Statistic       p-value
------------------------------------------------------------------------------
 lambda               1.6015         0.9454
------------------------------------------------------------------------------

. xtunitroot breitung lcorrupt

Breitung unit-root test for lcorrupt
------------------------------------
Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                sequentially
Time trend:   Not included              Prewhitening: Not performed
------------------------------------------------------------------------------
                    Statistic       p-value
------------------------------------------------------------------------------
 lambda               0.1295         0.5515
------------------------------------------------------------------------------

. xtunitroot breitung lcorrupt if numbcountry==1, robust

Breitung unit-root test for lcorrupt
------------------------------------
Ho: Panels contain unit roots           Number of panels  =      1
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                sequentially
Time trend:   Not included              Prewhitening: Not performed
------------------------------------------------------------------------------
                    Statistic       p-value
------------------------------------------------------------------------------
 lambda*             -1.2354         0.1083
------------------------------------------------------------------------------
 * Lambda robust to cross-sectional correlation

. xtunitroot breitung lcorrupt if numbcountry==1,trend

Breitung unit-root test for lcorrupt
------------------------------------
Ho: Panels contain unit roots           Number of panels  =      1
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                sequentially
Time trend:   Included                  Prewhitening: Not performed
------------------------------------------------------------------------------
                    Statistic       p-value
------------------------------------------------------------------------------
 lambda              -1.2598         0.1039
------------------------------------------------------------------------------
```

```
. xtunitroot breitung lcorrupt if numbcountry==11, robust

Breitung unit-root test for lcorrupt

Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics:  T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Not included                 Prewhitening: Not performed

                     Statistic      p-value

 lambda*               0.5417        0.7060

 * Lambda robust to cross-sectional correlation
. xtunitroot breitung lcorrupt if numbcountry==11,trend

Breitung unit-root test for lcorrupt

Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics:  T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Included                     Prewhitening: Not performed

                     Statistic      p-value

 lambda               -1.9016        0.0286

. xtunitroot breitung lcorrupt if numbcountry==12, robust

Breitung unit-root test for lcorrupt

Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics:  T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Not included                 Prewhitening: Not performed

                     Statistic      p-value

 lambda*              -1.6531        0.0492

 * Lambda robust to cross-sectional correlation
. xtunitroot breitung lcorrupt if numbcountry==12,trend

Breitung unit-root test for lcorrupt

Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics:  T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Included                     Prewhitening: Not performed

                     Statistic      p-value

 lambda               -0.3400        0.3669

. xtunitroot breitung lcorrupt if numbcountry==14, robust

Breitung unit-root test for lcorrupt

Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics:  T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Not included                 Prewhitening: Not performed

                     Statistic      p-value

 lambda*              -1.5800        0.0571

 * Lambda robust to cross-sectional correlation

. xtunitroot breitung lcorrupt if numbcountry==14,trend

Breitung unit-root test for lcorrupt

Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics:  T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Included                     Prewhitening: Not performed

                     Statistic      p-value

 lambda               -0.1932        0.4234
```

Appendix 5H10: Corruption Perception unit root test using IM PEARSON SHIN

```
. xtunitroot ips lcorrupt

Im-Pesaran-Shin unit-root test for lcorrupt

Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Not included

ADF regressions: No lags included

                                         Fixed-N exact critical values
                   Statistic    p-value       1%      5%     10%

 t-bar             -2.0762                -2.080  -1.910  -1.820
 t-tilde-bar       -1.8219
 Z-t-tilde-bar     -2.1487      0.0158

. xtunitroot ips lcorrupt, demean

Im-Pesaran-Shin unit-root test for lcorrupt

Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Not included                  Cross-sectional means removed

ADF regressions: No lags included

                                         Fixed-N exact critical values
                   Statistic    p-value       1%      5%     10%

 t-bar             -2.0921                -2.080  -1.910  -1.820
 t-tilde-bar       -1.7771
 Z-t-tilde-bar     -1.9233      0.0272

. xtunitroot ips lcorrupt ,demean trend

Im-Pesaran-Shin unit-root test for lcorrupt

Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Included                      Cross-sectional means removed

ADF regressions: No lags included

                                         Fixed-N exact critical values
                   Statistic    p-value       1%      5%     10%

 t-bar             -1.9642                -2.710  -2.550  -2.460
 t-tilde-bar       -1.7014
 Z-t-tilde-bar     -1.5425      0.0615
```

```
. xtunitroot ips  lcorrupt,trend

Im-Pesaran-Shin unit-root test for lcorrupt

Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Included

ADF regressions: No lags included

                                         Fixed-N exact critical values
                   Statistic    p-value       1%      5%     10%

 t-bar             -1.9950                -2.710  -2.550  -2.460
 t-tilde-bar       -1.7469
 Z-t-tilde-bar     -1.7713      0.0383

. xtunitroot ips  lcorrupt, lags(4)

Im-Pesaran-Shin unit-root test for lcorrupt

Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Not included

ADF regressions: 4 lags

                   Statistic    p-value

 W-t-bar           -0.1523      0.4395

. xtunitroot ips  lcorrupt,trend lags(4)

Im-Pesaran-Shin unit-root test for lcorrupt

Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Included

ADF regressions: 4 lags

                   Statistic    p-value

 W-t-bar            0.9018      0.8164
```

```
. xtunitroot ips  lcorrupt,trend demean lags(4)

Im-Pesaran-Shin unit-root test for lcorrupt
-------------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Included                      Cross-sectional means removed

ADF regressions: 4 lags
------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------
 W-t-bar                1.1885       0.8827
------------------------------------------------------------------------

. xtunitroot ips lcorrupt  if numbcountry==1

Im-Pesaran-Shin unit-root test for lcorrupt
-------------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------
                                            Fixed-N exact critical values
                     Statistic      p-value       1%       5%      10%
------------------------------------------------------------------------
 t-bar                 -3.7808                -2.500   -2.190   -2.040
 t-tilde-bar           -2.8674
 Z-t-tilde-bar         -1.9137       0.0278
------------------------------------------------------------------------
```

```
. xtunitroot ips lcorrupt if numbcountry==1

Im-Pesaran-Shin unit-root test for lcorrupt
-------------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------
                                            Fixed-N exact critical values
                     Statistic      p-value       1%       5%      10%
------------------------------------------------------------------------
 t-bar                 -3.7808                -2.500   -2.190   -2.040
 t-tilde-bar           -2.8674
 Z-t-tilde-bar         -1.9137       0.0278
------------------------------------------------------------------------

. xtunitroot ips lcorrupt if numbcountry==1, trend

Im-Pesaran-Shin unit-root test for lcorrupt
-------------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Included

ADF regressions: No lags included
------------------------------------------------------------------------
                                            Fixed-N exact critical values
                     Statistic      p-value       1%       5%      10%
------------------------------------------------------------------------
 t-bar                 -3.9607                -3.130   -2.820   -2.670
 t-tilde-bar           -2.9727
 Z-t-tilde-bar         -2.0505       0.0202
------------------------------------------------------------------------
```

```
. xtunitroot ips  lcorrupt if numbcountry==3

Im-Pesaran-Shin unit-root test for lcorrupt
-------------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                      sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                            Fixed-N exact critical values
                Statistic      p-value          1%        5%       10%
------------------------------------------------------------------------------
 t-bar           -3.8488                      -2.500   -2.190   -2.040
 t-tilde-bar     -2.8950
 Z-t-tilde-bar   -1.9496        0.0256
------------------------------------------------------------------------------
```

```
. xtunitroot ips lcorrupt  if numbcountry==3,trend

Im-Pesaran-Shin unit-root test for lcorrupt
-------------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                      sequentially
Time trend:   Included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                            Fixed-N exact critical values
                Statistic      p-value          1%        5%       10%
------------------------------------------------------------------------------
 t-bar           -2.2181                      -3.130   -2.820   -2.670
 t-tilde-bar     -1.6852
 Z-t-tilde-bar   -0.3771        0.3530
------------------------------------------------------------------------------
```

```
. xtunitroot ips  lcorrupt if numbcountry==14

Im-Pesaran-Shin unit-root test for lcorrupt
-------------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                      sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                            Fixed-N exact critical values
                Statistic      p-value          1%        5%       10%
------------------------------------------------------------------------------
 t-bar           -3.1675                      -2.500   -2.190   -2.040
 t-tilde-bar     -2.5847
 Z-t-tilde-bar   -1.5462        0.0610
------------------------------------------------------------------------------
```

```
. xtunitroot ips  lcorrupt if numbcountry==14,trend

Im-Pesaran-Shin unit-root test for lcorrupt
-------------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                      sequentially
Time trend:   Included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                            Fixed-N exact critical values
                Statistic      p-value          1%        5%       10%
------------------------------------------------------------------------------
 t-bar           -2.8845                      -3.130   -2.820   -2.670
 t-tilde-bar     -2.4262
 Z-t-tilde-bar   -1.3402        0.0901
------------------------------------------------------------------------------
```

Appendix 5H11: Corruption Perception unit root test using FISHER

```
. xtunitroot fisher  lcorrupt, dfuller lags(1)

Fisher-type unit-root test for lcorrupt
Based on augmented Dickey-Fuller tests
---------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: At least one panel is stationary        Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Not included
Drift term:   Not included                  ADF regressions: 1 lag
------------------------------------------------------------------------
                                  Statistic      p-value
------------------------------------------------------------------------
 Inverse chi-squared(30)   P        38.3351       0.1413
 Inverse normal            Z        -1.3852       0.0830
 Inverse logit t(79)       L*       -1.4340       0.0778
 Modified inv. chi-squared Pm        1.0761       0.1409
------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
------------------------------------------------------------------------
```

```
. xtunitroot fisher lcorrupt, dfuller lags(7) trend

Fisher-type unit-root test for lcorrupt
Based on augmented Dickey-Fuller tests
---------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: At least one panel is stationary        Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Included
Drift term:   Not included                  ADF regressions: 7 lags
------------------------------------------------------------------------
                                  Statistic      p-value
------------------------------------------------------------------------
 Inverse chi-squared(30)   P        46.0695       0.0306
 Inverse normal            Z         2.2612       0.9881
 Inverse logit t(74)       L*        1.9473       0.9724
 Modified inv. chi-squared Pm        2.0746       0.0190
------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
```

```
. xtunitroot fisher lcorrupt, dfuller lags(1) demean trend

Fisher-type unit-root test for lcorrupt
Based on augmented Dickey-Fuller tests
---------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: At least one panel is stationary        Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Included                      Cross-sectional means removed
Drift term:   Not included                  ADF regressions: 1 lag
------------------------------------------------------------------------
                                  Statistic      p-value
------------------------------------------------------------------------
 Inverse chi-squared(30)   P        28.8882       0.5235
 Inverse normal            Z         1.2999       0.9032
 Inverse logit t(79)       L*        1.0624       0.8544
 Modified inv. chi-squared Pm       -0.1435       0.5571
------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
------------------------------------------------------------------------
```

```
. xtunitroot fisher lcorrupt, dfuller lags(1) demean

Fisher-type unit-root test for lcorrupt
Based on augmented Dickey-Fuller tests
---------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: At least one panel is stationary        Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Not included                  Cross-sectional means removed
Drift term:   Not included                  ADF regressions: 1 lag
------------------------------------------------------------------------
                                  Statistic      p-value
------------------------------------------------------------------------
 Inverse chi-squared(30)   P        39.4970       0.1150
 Inverse normal            Z        -1.1469       0.1257
 Inverse logit t(79)       L*       -1.1981       0.1172
 Modified inv. chi-squared Pm        1.2261       0.1101
------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
------------------------------------------------------------------------
```

Appendix 5H12: Corruption Perception unit root test using HADRI LM

```
. xtunitroot hadri lcorrupt, kernel(bartlett 4)

Hadri LM test for lcorrupt
------------------------------
Ho: All panels are stationary                Number of panels  =     15
Ha: Some panels contain unit roots           Number of periods =     20

Time trend:          Not included            Asymptotics: T, N -> Infinity
Heteroskedasticity:  Robust                                  sequentially
LR variance:         Bartlett kernel, 4 lags
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 z                     5.9727        0.0000
------------------------------------------------------------------------------

. xtunitroot hadri lcorrupt, kernel(bartlett 4) trend

Hadri LM test for lcorrupt
------------------------------
Ho: All panels are stationary                Number of panels  =     15
Ha: Some panels contain unit roots           Number of periods =     20

Time trend:          Included                Asymptotics: T, N -> Infinity
Heteroskedasticity:  Robust                                  sequentially
LR variance:         Bartlett kernel, 4 lags
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 z                     6.1244        0.0000
------------------------------------------------------------------------------

. xtunitroot hadri lcorrupt, kernel(bartlett 4) trend demean

Hadri LM test for lcorrupt
------------------------------
Ho: All panels are stationary                Number of panels  =     15
Ha: Some panels contain unit roots           Number of periods =     20

Time trend:          Included                Asymptotics: T, N -> Infinity
Heteroskedasticity:  Robust                                  sequentially
LR variance:         Bartlett kernel, 4 lags Cross-sectional means removed
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 z                     6.1672        0.0000
------------------------------------------------------------------------------

. xtunitroot hadri lcorrupt, kernel(bartlett 4) demean

Hadri LM test for lcorrupt
------------------------------
Ho: All panels are stationary                Number of panels  =     15
Ha: Some panels contain unit roots           Number of periods =     20

Time trend:          Not included            Asymptotics: T, N -> Infinity
Heteroskedasticity:  Robust                                  sequentially
LR variance:         Bartlett kernel, 4 lags Cross-sectional means removed
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 z                     5.9954        0.0000
------------------------------------------------------------------------------
```

Appendix 5H13: Rule of law unit root test using LLC (Levin-Lin and Chu)

```
. xtunitroot llc lrule

Levin-Lin-Chu unit-root test for lrule

Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                      Statistic      p-value

 Unadjusted t          -6.7080
 Adjusted t*           -2.9093        0.0018
```

```
. xtunitroot llc lrule, demean

Levin-Lin-Chu unit-root test for lrule

Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included              Cross-sectional means removed

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                      Statistic      p-value

 Unadjusted t          -6.5721
 Adjusted t*           -2.8738        0.0020
```

```
. xtunitroot llc lrule,demean trend

Levin-Lin-Chu unit-root test for lrule

Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included                  Cross-sectional means removed

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                      Statistic      p-value

 Unadjusted t          -7.2627
 Adjusted t*           -2.1031        0.0177
```

```
. xtunitroot llc lrule,trend

Levin-Lin-Chu unit-root test for lrule

Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                      Statistic      p-value

 Unadjusted t          -7.4607
 Adjusted t*           -2.2186        0.0133
```

```
. xtunitroot llc lrule, lags(aic 4)

Levin-Lin-Chu unit-root test for lrule
Ho: Panels contain unit roots                Number of panels  =     15
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 0.87 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                        Statistic      p-value

 Unadjusted t            -6.4509
 Adjusted t*             -2.7353        0.0031

. xtunitroot llc lrule,trend lags(aic 10)

Levin-Lin-Chu unit-root test for lrule
Ho: Panels contain unit roots                Number of panels  =     15
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 4.20 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                        Statistic      p-value

 Unadjusted t            -7.0387
 Adjusted t*              1.2632        0.8967

. xtunitroot llc lrule,trend demean lags(aic 4)

Levin-Lin-Chu unit-root test for lrule
Ho: Panels contain unit roots                Number of panels  =     15
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included                       Cross-sectional means removed

ADF regressions: 1.13 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                        Statistic      p-value

 Unadjusted t            -7.4706
 Adjusted t*             -2.3238        0.0101
```

```
. xtunitroot llc lrule if numbcountry==1

Levin-Lin-Chu unit-root test for lrule
Ho: Panels contain unit roots                Number of panels  =      1
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                        Statistic      p-value

 Unadjusted t            -2.0354
 Adjusted t*             -1.3263        0.0924

. xtunitroot llc lrule if numbcountry==2

Levin-Lin-Chu unit-root test for lrule
Ho: Panels contain unit roots                Number of panels  =      1
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                        Statistic      p-value

 Unadjusted t            -2.2546
 Adjusted t*             -1.1041        0.1348

. xtunitroot llc lrule if numbcountry==3

Levin-Lin-Chu unit-root test for lrule
Ho: Panels contain unit roots                Number of panels  =      1
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                        Statistic      p-value

 Unadjusted t            -2.7462
 Adjusted t*             -1.2759        0.1010
```

```
. xtunitroot llc lrule if numbcountry==7

Levin-Lin-Chu unit-root test for lrule
--------------------------------------
Ho: Panels contain unit roots                Number of panels  =      1
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------
 Unadjusted t         -3.3588
 Adjusted t*          -2.1324        0.0165
------------------------------------------------------------------------

. xtunitroot llc lrule if numbcountry==8

Levin-Lin-Chu unit-root test for lrule
--------------------------------------
Ho: Panels contain unit roots                Number of panels  =      1
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------
 Unadjusted t         -1.2728
 Adjusted t*           1.0496        0.8530
------------------------------------------------------------------------

. xtunitroot llc lrule if numbcountry==9

Levin-Lin-Chu unit-root test for lrule
--------------------------------------
Ho: Panels contain unit roots                Number of panels  =      1
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------
 Unadjusted t         -1.1560
 Adjusted t*          -0.7426        0.2289
------------------------------------------------------------------------
```

Appendix 5H14: Rule of law unit root test using Harris Tzavalis

```
. xtunitroot ht lrule

Harris-Tzavalis unit-root test for lrule
----------------------------------------
Ho: Panels contain unit roots              Number of panels  =     15
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N -> Infinity
Panel means:  Included                                  T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                    Statistic        z            p-value
------------------------------------------------------------------------------
 rho                 0.8607        0.0941          0.5375
------------------------------------------------------------------------------

. xtunitroot ht lrule, demean

Harris-Tzavalis unit-root test for lrule
----------------------------------------
Ho: Panels contain unit roots              Number of panels  =     15
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N -> Infinity
Panel means:  Included                                  T Fixed
Time trend:   Not included                 Cross-sectional means removed
------------------------------------------------------------------------------
                    Statistic        z            p-value
------------------------------------------------------------------------------
 rho                 0.8655        0.2177          0.5861
------------------------------------------------------------------------------

. xtunitroot ht lrule,demean trend

Harris-Tzavalis unit-root test for lrule
----------------------------------------
Ho: Panels contain unit roots              Number of panels  =     15
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N -> Infinity
Panel means:  Included                                  T Fixed
Time trend:   Included                     Cross-sectional means removed
------------------------------------------------------------------------------
                    Statistic        z            p-value
------------------------------------------------------------------------------
 rho                 0.7790        2.1993          0.9861
------------------------------------------------------------------------------

. xtunitroot ht lrule,trend

Harris-Tzavalis unit-root test for lrule
----------------------------------------
Ho: Panels contain unit roots              Number of panels  =     15
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N -> Infinity
Panel means:  Included                                  T Fixed
Time trend:   Included
------------------------------------------------------------------------------
                    Statistic        z            p-value
------------------------------------------------------------------------------
 rho                 0.7622        1.8924          0.9708
------------------------------------------------------------------------------
```

```
. xtunitroot ht lrule if numbcountry==1

Harris-Tzavalis unit-root test for lrule
----------------------------------------
Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N -> Infinity
Panel means:  Included                                  T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                    Statistic        z            p-value
------------------------------------------------------------------------------
 rho                 0.9009        0.2960          0.6164
------------------------------------------------------------------------------

. xtunitroot ht lrule if numbcountry==2

Harris-Tzavalis unit-root test for lrule
----------------------------------------
Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N -> Infinity
Panel means:  Included                                  T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                    Statistic        z            p-value
------------------------------------------------------------------------------
 rho                 0.8168       -0.2727          0.3925
------------------------------------------------------------------------------
```

```
. xtunitroot ht lrule if numbcountry==9

Harris-Tzavalis unit-root test for lrule
----------------------------------------
Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N -> Infinity
Panel means:  Included                                  T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                    Statistic          z        p-value
------------------------------------------------------------------------------
 rho                  0.9424        0.5764       0.7178
------------------------------------------------------------------------------

. xtunitroot ht lrule if numbcountry==10

Harris-Tzavalis unit-root test for lrule
----------------------------------------
Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N -> Infinity
Panel means:  Included                                  T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                    Statistic          z        p-value
------------------------------------------------------------------------------
 rho                  0.9034        0.3130       0.6228
------------------------------------------------------------------------------

. xtunitroot ht lrule if numbcountry==11

Harris-Tzavalis unit-root test for lrule
----------------------------------------
Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N -> Infinity
Panel means:  Included                                  T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                    Statistic          z        p-value
------------------------------------------------------------------------------
 rho                  0.5747       -1.9097       0.0281
------------------------------------------------------------------------------
```

Appendix 5H15: Rule of law unit root test using breitung

```
. xtunitroot llc lrule

Levin-Lin-Chu unit-root test for lrule

Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                    Statistic      p-value

 Unadjusted t         -6.7080
 Adjusted t*          -2.9093       0.0018
```

```
. xtunitroot llc lrule, demean

Levin-Lin-Chu unit-root test for lrule

Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included                  Cross-sectional means removed

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                    Statistic      p-value

 Unadjusted t         -6.5721
 Adjusted t*          -2.8738       0.0020
```

```
. xtunitroot llc lrule,demean trend

Levin-Lin-Chu unit-root test for lrule

Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included                      Cross-sectional means removed

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                    Statistic      p-value

 Unadjusted t         -7.2627
 Adjusted t*          -2.1031       0.0177
```

```
. xtunitroot llc lrule,trend

Levin-Lin-Chu unit-root test for lrule

Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                    Statistic      p-value

 Unadjusted t         -7.4607
 Adjusted t*          -2.2186       0.0133
```

```
. xtunitroot llc lrule, lags(aic 4)

Levin-Lin-Chu unit-root test for lrule
--------------------------------------
Ho: Panels contain unit roots                Number of panels  =     15
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 0.87 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -6.4509
 Adjusted t*         -2.7353        0.0031
------------------------------------------------------------------------------

. xtunitroot llc lrule,trend lags(aic 10)

Levin-Lin-Chu unit-root test for lrule
--------------------------------------
Ho: Panels contain unit roots                Number of panels  =     15
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 4.20 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -7.0387
 Adjusted t*          1.2632        0.8967
------------------------------------------------------------------------------

. xtunitroot llc lrule,trend demean lags(aic 4)

Levin-Lin-Chu unit-root test for lrule
--------------------------------------
Ho: Panels contain unit roots                Number of panels  =     15
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included                       Cross-sectional means removed

ADF regressions: 1.13 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -7.4706
 Adjusted t*         -2.3238        0.0101
------------------------------------------------------------------------------
```

Appendix 5H16: Rule of law unit root test using IM PEARSON SHIN

```
. xtunitroot ips lrule

Im-Pesaran-Shin unit-root test for lrule

Ho: All panels contain unit roots            Number of panels  =     15
Ha: Some panels are stationary               Number of periods =     20

AR parameter: Panel-specific                 Asymptotics: T,N -> Infinity
Panel means:  Included                                       sequentially
Time trend:   Not included

ADF regressions: No lags included

                                             Fixed-N exact critical values
                  Statistic      p-value        1%       5%      10%

 t-bar             -1.5521                    -2.080   -1.910   -1.820
 t-tilde-bar       -1.4603
 Z-t-tilde-bar     -0.3287       0.3712
```

```
. xtunitroot ips lrule, demean

Im-Pesaran-Shin unit-root test for lrule

Ho: All panels contain unit roots            Number of panels  =     15
Ha: Some panels are stationary               Number of periods =     20

AR parameter: Panel-specific                 Asymptotics: T,N -> Infinity
Panel means:  Included                                       sequentially
Time trend:   Not included                   Cross-sectional means removed

ADF regressions: No lags included

                                             Fixed-N exact critical values
                  Statistic      p-value        1%       5%      10%

 t-bar             -1.5715                    -2.080   -1.910   -1.820
 t-tilde-bar       -1.4736
 Z-t-tilde-bar     -0.3956       0.3462
```

```
. xtunitroot ips lrule ,demean trend

Im-Pesaran-Shin unit-root test for lrule

Ho: All panels contain unit roots            Number of panels  =     15
Ha: Some panels are stationary               Number of periods =     20

AR parameter: Panel-specific                 Asymptotics: T,N -> Infinity
Panel means:  Included                                       sequentially
Time trend:   Included                       Cross-sectional means removed

ADF regressions: No lags included

                                             Fixed-N exact critical values
                  Statistic      p-value        1%       5%      10%

 t-bar             -1.6891                    -2.710   -2.550   -2.460
 t-tilde-bar       -1.5007
 Z-t-tilde-bar     -0.5319       0.2974
```

```
. xtunitroot ips lrule,trend

Im-Pesaran-Shin unit-root test for lrule

Ho: All panels contain unit roots            Number of panels  =     15
Ha: Some panels are stationary               Number of periods =     20

AR parameter: Panel-specific                 Asymptotics: T,N -> Infinity
Panel means:  Included                                       sequentially
Time trend:   Included

ADF regressions: No lags included

                                             Fixed-N exact critical values
                  Statistic      p-value        1%       5%      10%

 t-bar             -1.7827                    -2.710   -2.550   -2.460
 t-tilde-bar       -1.5586
 Z-t-tilde-bar     -0.8233       0.2052
```

```
. xtunitroot ips lrule, lags(4)

Im-Pesaran-Shin unit-root test for lrule
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Not included

ADF regressions: 4 lags
------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------
 W-t-bar              -1.2478       0.1061
------------------------------------------------------------------------
```

```
. xtunitroot ips lrule,trend lags(4)

Im-Pesaran-Shin unit-root test for lrule
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Included

ADF regressions: 4 lags
------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------
 W-t-bar               0.9177       0.8206
------------------------------------------------------------------------
```

```
. xtunitroot ips lrule,trend demean lags(4)

Im-Pesaran-Shin unit-root test for lrule
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Included                      Cross-sectional means removed

ADF regressions: 4 lags
------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------
 W-t-bar               0.3105       0.6219
------------------------------------------------------------------------
```

```
. xtunitroot ips lrule if numbcountry==1

Im-Pesaran-Shin unit-root test for lrule
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------
                                            Fixed-N exact critical values
                    Statistic      p-value        1%       5%      10%
------------------------------------------------------------------------
 t-bar               -1.3846                  -2.500   -2.190   -2.040
 t-tilde-bar         -1.3507
 Z-t-tilde-bar        0.0576       0.5230
------------------------------------------------------------------------
```

```
. xtunitroot ips lrule if numbcountry==4

Im-Pesaran-Shin unit-root test for lrule
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                       sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                    Statistic      p-value         1%        5%        10%
------------------------------------------------------------------------------
 t-bar               -1.4272                      -2.500    -2.190    -2.040
 t-tilde-bar         -1.3878
 Z-t-tilde-bar        0.0094        0.5037
------------------------------------------------------------------------------

. xtunitroot ips lrule if numbcountry==4, trend

Im-Pesaran-Shin unit-root test for lrule
----------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                       sequentially
Time trend:   Included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                    Statistic      p-value         1%        5%        10%
------------------------------------------------------------------------------
 t-bar               -5.2256                      -3.130    -2.820    -2.670
 t-tilde-bar         -3.3689
 Z-t-tilde-bar       -2.5655        0.0052
------------------------------------------------------------------------------
```

Appendix 5H17: Rule of law unit root test using FISHER

```
. xtunitroot fisher lrule, dfuller lags(1)

Fisher-type unit-root test for lrule
Based on augmented Dickey-Fuller tests

Ho: All panels contain unit roots           Number of panels  =     15
Ha: At least one panel is stationary        Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Not included
Drift term:   Not included                  ADF regressions: 1 lag

                              Statistic      p-value

 Inverse chi-squared(30)   P    38.1864       0.1450
 Inverse normal            Z    -1.2228       0.1107
 Inverse logit t(79)       L*   -1.2010       0.1167
 Modified inv. chi-squared Pm    1.0569       0.1453

 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
```

```
. xtunitroot fisher lrule, dfuller lags(7) trend

Fisher-type unit-root test for lrule
Based on augmented Dickey-Fuller tests

Ho: All panels contain unit roots           Number of panels  =     15
Ha: At least one panel is stationary        Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Included
Drift term:   Not included                  ADF regressions: 7 lags

                              Statistic      p-value

 Inverse chi-squared(30)   P    13.6842       0.9953
 Inverse normal            Z     3.5774       0.9998
 Inverse logit t(74)       L*    3.7852       0.9998
 Modified inv. chi-squared Pm   -2.1064       0.9824

 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
```

```
. xtunitroot fisher lrule, dfuller lags(1) demean trend

Fisher-type unit-root test for lrule
Based on augmented Dickey-Fuller tests

Ho: All panels contain unit roots           Number of panels  =     15
Ha: At least one panel is stationary        Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Included                      Cross-sectional means removed
Drift term:   Not included                  ADF regressions: 1 lag

                              Statistic      p-value

 Inverse chi-squared(30)   P    27.6673       0.5881
 Inverse normal            Z     0.7700       0.7794
 Inverse logit t(79)       L*    0.8549       0.8024
 Modified inv. chi-squared Pm   -0.3011       0.6183

 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
```

```
. xtunitroot fisher lrule, dfuller lags(1) demean

Fisher-type unit-root test for lrule
Based on augmented Dickey-Fuller tests

Ho: All panels contain unit roots           Number of panels  =     15
Ha: At least one panel is stationary        Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Not included                  Cross-sectional means removed
Drift term:   Not included                  ADF regressions: 1 lag

                              Statistic      p-value

 Inverse chi-squared(30)   P    40.3814       0.0977
 Inverse normal            Z    -1.2573       0.1043
 Inverse logit t(79)       L*   -1.2412       0.1091
 Modified inv. chi-squared Pm    1.3402       0.0901

 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
```

Appendix 5H18: Rule of law unit root test using HADRI LM

```
. xtunitroot hadri lrule , kernel(bartlett 4)

Hadri LM test for lrule
-------------------------------------------
Ho: All panels are stationary              Number of panels  =     15
Ha: Some panels contain unit roots         Number of periods =     20

Time trend:         Not included           Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                  sequentially
LR variance:        Bartlett kernel, 4 lags
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                    5.8071        0.0000
------------------------------------------------------------------------------

. xtunitroot hadri lrule, kernel(bartlett 4) trend

Hadri LM test for lrule
-------------------------------------------
Ho: All panels are stationary              Number of panels  =     15
Ha: Some panels contain unit roots         Number of periods =     20

Time trend:         Included               Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                  sequentially
LR variance:        Bartlett kernel, 4 lags
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                    6.0800        0.0000
------------------------------------------------------------------------------

. xtunitroot hadri lrule, kernel(bartlett 4) trend demean

Hadri LM test for lrule
-------------------------------------------
Ho: All panels are stationary              Number of panels  =     15
Ha: Some panels contain unit roots         Number of periods =     20

Time trend:         Included               Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                  sequentially
LR variance:        Bartlett kernel, 4 lags Cross-sectional means removed
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                    6.1093        0.0000
------------------------------------------------------------------------------

. xtunitroot hadri lrule, kernel(bartlett 4) demean

Hadri LM test for lrule
-------------------------------------------
Ho: All panels are stationary              Number of panels  =     15
Ha: Some panels contain unit roots         Number of periods =     20

Time trend:         Not included           Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                  sequentially
LR variance:        Bartlett kernel, 4 lags Cross-sectional means removed
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                    5.6333        0.0000
------------------------------------------------------------------------------
```

Appendix 5H19: Political stability unit root test using LLC (Levin-Lin and Chu)

```
. xtunitroot llc lpolitical

Levin-Lin-Chu unit-root test for lpolitical
-------------------------------------------
Ho: Panels contain unit roots                 Number of panels  =     15
Ha: Panels are stationary                     Number of periods =     20

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                      Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t          -6.0070
 Adjusted t*           -2.5866        0.0048
------------------------------------------------------------------------------

. xtunitroot llc lpolitical, demean

Levin-Lin-Chu unit-root test for lpolitical
-------------------------------------------
Ho: Panels contain unit roots                 Number of panels  =     15
Ha: Panels are stationary                     Number of periods =     20

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included                    Cross-sectional means removed

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                      Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t          -6.1180
 Adjusted t*           -2.6843        0.0036
------------------------------------------------------------------------------

. xtunitroot llc lpolitical,demean trend

Levin-Lin-Chu unit-root test for lpolitical
-------------------------------------------
Ho: Panels contain unit roots                 Number of panels  =     15
Ha: Panels are stationary                     Number of periods =     20

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included                        Cross-sectional means removed

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                      Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t          -8.4865
 Adjusted t*           -3.1001        0.0010
------------------------------------------------------------------------------
```

```
. xtunitroot llc lpolitical,trend

Levin-Lin-Chu unit-root test for lpolitical
-------------------------------------------
Ho: Panels contain unit roots                 Number of panels  =     15
Ha: Panels are stationary                     Number of periods =     20

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                      Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t          -8.5387
 Adjusted t*           -3.0514        0.0011
------------------------------------------------------------------------------

. xtunitroot llc lpolitical, lags(aic 4)

Levin-Lin-Chu unit-root test for lpolitical
-------------------------------------------
Ho: Panels contain unit roots                 Number of panels  =     15
Ha: Panels are stationary                     Number of periods =     20

AR parameter: Common                          Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 0.87 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                      Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t          -6.7873
 Adjusted t*           -2.9658        0.0015
------------------------------------------------------------------------------
```

```
. xtunitroot llc lpolitical,trend lags(aic 10)

Levin-Lin-Chu unit-root test for lpolitical
-------------------------------------------
Ho: Panels contain unit roots                Number of panels  =     15
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 3.87 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -10.8710
 Adjusted t*          -3.0568       0.0011
------------------------------------------------------------------------------
```

```
. xtunitroot llc lpolitical,trend demean lags(aic 4)

Levin-Lin-Chu unit-root test for lpolitical
-------------------------------------------
Ho: Panels contain unit roots                Number of panels  =     15
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included                       Cross-sectional means removed

ADF regressions: 0.93 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t         -9.4197
 Adjusted t*          -4.0591       0.0000
------------------------------------------------------------------------------
```

```
. xtunitroot llc lpolitical if numbcountry==7

Levin-Lin-Chu unit-root test for lpolitical
-------------------------------------------
Ho: Panels contain unit roots                Number of panels  =      1
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t         -3.2611
 Adjusted t*          -2.1277       0.0167
------------------------------------------------------------------------------
```

```
. xtunitroot llc lpolitical if numbcountry==8

Levin-Lin-Chu unit-root test for lpolitical
-------------------------------------------
Ho: Panels contain unit roots                Number of panels  =      1
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t         -2.2605
 Adjusted t*          -0.5012       0.3081
```

```
. xtunitroot llc lpolitical if numbcountry==11

Levin-Lin-Chu unit-root test for lpolitical

Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                     Statistic      p-value

 Unadjusted t         -1.1170
 Adjusted t*          -0.3342        0.3691
```

```
. xtunitroot llc lpolitical if numbcountry==12

Levin-Lin-Chu unit-root test for lpolitical

Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                     Statistic      p-value

 Unadjusted t         -2.0162
 Adjusted t*          -1.4276        0.0767
```

```
. xtunitroot llc lpolitical if numbcountry==13

Levin-Lin-Chu unit-root test for lpolitical

Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                     Statistic      p-value

 Unadjusted t         -2.1324
 Adjusted t*          -1.4260        0.0769
```

```
. xtunitroot llc lpolitical  if numbcountry==14

Levin-Lin-Chu unit-root test for lpolitical

Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                     Statistic      p-value

 Unadjusted t         -1.5450
 Adjusted t*          -0.9008        0.1838
```

```
. xtunitroot llc lpolitical if numbcountry==15

Levin-Lin-Chu unit-root test for lpolitical

Ho: Panels contain unit roots              Number of panels  =      1
Ha: Panels are stationary                  Number of periods =     20

AR parameter: Common                       Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                     Statistic      p-value

 Unadjusted t         -2.8517
 Adjusted t*          -1.6568        0.0488
```

Appendix 5H20: Political stability unit root test using Harris Tzavalis

```
. xtunitroot ht lpolitical

Harris-Tzavalis unit-root test for lpolitical
--------------------------------------------------------------
Ho: Panels contain unit roots            Number of panels  =     15
Ha: Panels are stationary                Number of periods =     20

AR parameter: Common                     Asymptotics: N -> Infinity
Panel means:  Included                                T Fixed
Time trend:   Not included
------------------------------------------------------------------------
                   Statistic           z           p-value
------------------------------------------------------------------------
 rho                 0.8507       -0.1691          0.4329
------------------------------------------------------------------------

. xtunitroot ht lpolitical, demean

Harris-Tzavalis unit-root test for lpolitical
--------------------------------------------------------------
Ho: Panels contain unit roots            Number of panels  =     15
Ha: Panels are stationary                Number of periods =     20

AR parameter: Common                     Asymptotics: N -> Infinity
Panel means:  Included                                T Fixed
Time trend:   Not included               Cross-sectional means removed
------------------------------------------------------------------------
                   Statistic           z           p-value
------------------------------------------------------------------------
 rho                 0.8563       -0.0227          0.4910
------------------------------------------------------------------------

. xtunitroot ht lpolitical,demean trend

Harris-Tzavalis unit-root test for lpolitical
--------------------------------------------------------------
Ho: Panels contain unit roots            Number of panels  =     15
Ha: Panels are stationary                Number of periods =     20

AR parameter: Common                     Asymptotics: N -> Infinity
Panel means:  Included                                T Fixed
Time trend:   Included                   Cross-sectional means removed
------------------------------------------------------------------------
                   Statistic           z           p-value
------------------------------------------------------------------------
 rho                 0.7260        1.2265          0.8900
------------------------------------------------------------------------

. xtunitroot ht lpolitical,trend

Harris-Tzavalis unit-root test for lpolitical
--------------------------------------------------------------
Ho: Panels contain unit roots            Number of panels  =     15
Ha: Panels are stationary                Number of periods =     20

AR parameter: Common                     Asymptotics: N -> Infinity
Panel means:  Included                                T Fixed
Time trend:   Included
------------------------------------------------------------------------
                   Statistic           z           p-value
------------------------------------------------------------------------
 rho                 0.7171        1.0644          0.8564
------------------------------------------------------------------------
```

```
. xtunitroot ht lpolitical if numbcountry==1

Harris-Tzavalis unit-root test for lpolitical
--------------------------------------------------------------
Ho: Panels contain unit roots            Number of panels  =      1
Ha: Panels are stationary                Number of periods =     20

AR parameter: Common                     Asymptotics: N -> Infinity
Panel means:  Included                                T Fixed
Time trend:   Not included
------------------------------------------------------------------------
                   Statistic           z           p-value
------------------------------------------------------------------------
 rho                 0.8427       -0.0976          0.4611
------------------------------------------------------------------------

. xtunitroot ht lpolitical if numbcountry==2

Harris-Tzavalis unit-root test for lpolitical
--------------------------------------------------------------
Ho: Panels contain unit roots            Number of panels  =      1
Ha: Panels are stationary                Number of periods =     20

AR parameter: Common                     Asymptotics: N -> Infinity
Panel means:  Included                                T Fixed
Time trend:   Not included
------------------------------------------------------------------------
                   Statistic           z           p-value
------------------------------------------------------------------------
 rho                 0.8470       -0.0688          0.4726
------------------------------------------------------------------------

. xtunitroot ht lpolitical  if numbcountry==3

Harris-Tzavalis unit-root test for lpolitical
--------------------------------------------------------------
Ho: Panels contain unit roots            Number of panels  =      1
Ha: Panels are stationary                Number of periods =     20

AR parameter: Common                     Asymptotics: N -> Infinity
Panel means:  Included                                T Fixed
Time trend:   Not included
------------------------------------------------------------------------
                   Statistic           z           p-value
------------------------------------------------------------------------
 rho                 0.3408       -3.4908          0.0002
------------------------------------------------------------------------
```

```
. xtunitroot ht lpolitical if numbcountry==13

Harris-Tzavalis unit-root test for lpolitical
---------------------------------------------
Ho: Panels contain unit roots                Number of panels  =      1
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N -> Infinity
Panel means:  Included                                    T Fixed
Time trend:   Not included
-----------------------------------------------------------------------
                    Statistic         z          p-value
-----------------------------------------------------------------------
 rho                  0.8552       -0.0133       0.4947
-----------------------------------------------------------------------

. xtunitroot ht lpolitical if numbcountry==14

Harris-Tzavalis unit-root test for lpolitical
---------------------------------------------
Ho: Panels contain unit roots                Number of panels  =      1
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N -> Infinity
Panel means:  Included                                    T Fixed
Time trend:   Not included
-----------------------------------------------------------------------
                    Statistic         z          p-value
-----------------------------------------------------------------------
 rho                  0.9239        0.4512       0.6741
-----------------------------------------------------------------------

. xtunitroot ht lpolitical if numbcountry==15

Harris-Tzavalis unit-root test for lpolitical
---------------------------------------------
Ho: Panels contain unit roots                Number of panels  =      1
Ha: Panels are stationary                    Number of periods =     20

AR parameter: Common                         Asymptotics: N -> Infinity
Panel means:  Included                                    T Fixed
Time trend:   Not included
-----------------------------------------------------------------------
                    Statistic         z          p-value
-----------------------------------------------------------------------
 rho                  0.2990       -3.7729       0.0001
-----------------------------------------------------------------------
```

Appendix 5H21: Political stability unit root test using breitung

```
. xtunitroot breitung lpolitical,trend robust

Breitung unit-root test for lpolitical
--------------------------------------
Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                 sequentially
Time trend:   Included                  Prewhitening: Not performed
------------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------------
 lambda*              0.0197       0.5078
------------------------------------------------------------------------------
 * Lambda robust to cross-sectional correlation

. xtunitroot breitung lpolitical, demean

Breitung unit-root test for lpolitical
--------------------------------------
Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                 sequentially
Time trend:   Not included              Prewhitening: Not performed
                                        Cross-sectional means removed
------------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------------
 lambda              -0.3820       0.3512
```

```
. xtunitroot breitung lpolitical if numbcountry==1, robust

Breitung unit-root test for lpolitical
--------------------------------------
Ho: Panels contain unit roots           Number of panels  =      1
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                 sequentially
Time trend:   Not included              Prewhitening: Not performed
------------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------------
 lambda*              0.8256       0.7955
------------------------------------------------------------------------------
 * Lambda robust to cross-sectional correlation

. xtunitroot breitung lpolitical if numbcountry==1,trend

Breitung unit-root test for lpolitical
--------------------------------------
Ho: Panels contain unit roots           Number of panels  =      1
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                 sequentially
Time trend:   Included                  Prewhitening: Not performed
------------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------------
 lambda              -2.0300       0.0212
------------------------------------------------------------------------------
```

```
. xtunitroot breitung lpolitical if numbcountry==15, robust

Breitung unit-root test for lpolitical
--------------------------------------
Ho: Panels contain unit roots           Number of panels  =      1
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                 sequentially
Time trend:   Not included              Prewhitening: Not performed
------------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------------
 lambda*             -2.8388       0.0023
------------------------------------------------------------------------------
 * Lambda robust to cross-sectional correlation

. xtunitroot breitung lpolitical if numbcountry==15,trend

Breitung unit-root test for lpolitical
--------------------------------------
Ho: Panels contain unit roots           Number of panels  =      1
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                 sequentially
Time trend:   Included                  Prewhitening: Not performed
------------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------------
 lambda              -2.3311       0.0099
------------------------------------------------------------------------------
```

Appendix 5H22: Political stability unit root test using IM PEARSON SHIN

```
. xtunitroot ips lpolitical

Im-Pesaran-Shin unit-root test for lpolitical
---------------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                             Fixed-N exact critical values
                  Statistic      p-value          1%        5%        10%
------------------------------------------------------------------------------
 t-bar             -1.4982                     -2.080    -1.910    -1.820
 t-tilde-bar       -1.4016
 Z-t-tilde-bar     -0.0333        0.4867
------------------------------------------------------------------------------

. xtunitroot ips lpolitical, demean

Im-Pesaran-Shin unit-root test for lpolitical
---------------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Not included                  Cross-sectional means removed

ADF regressions: No lags included
------------------------------------------------------------------------------
                                             Fixed-N exact critical values
                  Statistic      p-value          1%        5%        10%
------------------------------------------------------------------------------
 t-bar             -1.4759                     -2.080    -1.910    -1.820
 t-tilde-bar       -1.3909
 Z-t-tilde-bar      0.0204        0.5082
------------------------------------------------------------------------------
```

```
. xtunitroot ips lpolitical,demean trend

Im-Pesaran-Shin unit-root test for lpolitical
---------------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Included                      Cross-sectional means removed

ADF regressions: No lags included
------------------------------------------------------------------------------
                                             Fixed-N exact critical values
                  Statistic      p-value          1%        5%        10%
------------------------------------------------------------------------------
 t-bar             -2.1415                     -2.710    -2.550    -2.460
 t-tilde-bar       -1.9018
 Z-t-tilde-bar     -2.5511        0.0054
------------------------------------------------------------------------------

. xtunitroot ips lpolitical,trend

Im-Pesaran-Shin unit-root test for lpolitical
---------------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                             Fixed-N exact critical values
                  Statistic      p-value          1%        5%        10%
------------------------------------------------------------------------------
 t-bar             -2.2130                     -2.710    -2.550    -2.460
 t-tilde-bar       -1.9239
 Z-t-tilde-bar     -2.6625        0.0039
------------------------------------------------------------------------------
```

```
. xtunitroot ips lpolitical, lags(4)

Im-Pesaran-Shin unit-root test for lpolitical
---------------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                      sequentially
Time trend:   Not included

ADF regressions: 4 lags
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar              -0.8787        0.1898
------------------------------------------------------------------------------

. xtunitroot ips lpolitical,trend lags(4)

Im-Pesaran-Shin unit-root test for lpolitical
---------------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                      sequentially
Time trend:   Included

ADF regressions: 4 lags
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar               0.1757        0.5697
------------------------------------------------------------------------------

. xtunitroot ips lpolitical,trend demean lags(4)

Im-Pesaran-Shin unit-root test for lpolitical
---------------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                      sequentially
Time trend:   Included                      Cross-sectional means removed

ADF regressions: 4 lags
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 W-t-bar               0.3855        0.6501
------------------------------------------------------------------------------
```

```
. xtunitroot ips lpolitical if numbcountry==3

Im-Pesaran-Shin unit-root test for lpolitical
---------------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                    sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                  Statistic      p-value          1%        5%       10%
------------------------------------------------------------------------------
 t-bar              -2.8970                     -2.500    -2.190    -2.040
 t-tilde-bar        -2.4391
 Z-t-tilde-bar      -1.3570       0.0874
------------------------------------------------------------------------------

. xtunitroot ips lpolitical if numbcountry==3,trend

Im-Pesaran-Shin unit-root test for lpolitical
---------------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                    sequentially
Time trend:   Included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                  Statistic      p-value          1%        5%       10%
------------------------------------------------------------------------------
 t-bar              -4.6404                     -3.130    -2.820    -2.670
 t-tilde-bar        -3.2135
 Z-t-tilde-bar      -2.3634       0.0091
```

```
. xtunitroot ips lpolitical if numbcountry==15

Im-Pesaran-Shin unit-root test for lpolitical
---------------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                        sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                    Statistic      p-value          1%       5%       10%
------------------------------------------------------------------------------
 t-bar               -2.9906                     -2.500   -2.190   -2.040
 t-tilde-bar         -2.4910
 Z-t-tilde-bar       -1.4245        0.0772
------------------------------------------------------------------------------

. xtunitroot ips lpolitical if numbcountry==15,trend

Im-Pesaran-Shin unit-root test for lpolitical
---------------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                        sequentially
Time trend:   Included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                              Fixed-N exact critical values
                    Statistic      p-value          1%       5%       10%
------------------------------------------------------------------------------
 t-bar               -3.1936                     -3.130   -2.820   -2.670
 t-tilde-bar         -2.6456
 Z-t-tilde-bar       -1.6254        0.0520
------------------------------------------------------------------------------
```

Appendix 5H23: Political stability unit root test using FISHER

```
. xtunitroot fisher lpolitical, dfuller lags(1)

Fisher-type unit-root test for lpolitical
Based on augmented Dickey-Fuller tests
-----------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: At least one panel is stationary        Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Not included
Drift term:   Not included                  ADF regressions: 1 lag
------------------------------------------------------------------------
                                    Statistic      p-value
------------------------------------------------------------------------
 Inverse chi-squared(30)   P         30.2226        0.4543
 Inverse normal            Z         -0.2563        0.3989
 Inverse logit t(79)       L*        -0.2722        0.3931
 Modified inv. chi-squared Pm         0.0287        0.4885
------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
------------------------------------------------------------------------

. xtunitroot fisher lpolitical, dfuller lags(7) trend

Fisher-type unit-root test for lpolitical
Based on augmented Dickey-Fuller tests
-----------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: At least one panel is stationary        Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Included
Drift term:   Not included                  ADF regressions: 7 lags
------------------------------------------------------------------------
                                    Statistic      p-value
------------------------------------------------------------------------
 Inverse chi-squared(30)   P         51.5928        0.0084
 Inverse normal            Z          2.5780        0.9950
 Inverse logit t(64)       L*         0.8780        0.8084
 Modified inv. chi-squared Pm         2.7876        0.0027
------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.

. xtunitroot fisher lpolitical, dfuller lags(1) demean trend

Fisher-type unit-root test for lpolitical
Based on augmented Dickey-Fuller tests
-----------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: At least one panel is stationary        Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Included                      Cross-sectional means removed
Drift term:   Not included                  ADF regressions: 1 lag
------------------------------------------------------------------------
                                    Statistic      p-value
------------------------------------------------------------------------
 Inverse chi-squared(30)   P         38.2977        0.1423
 Inverse normal            Z         -0.9616        0.1681
 Inverse logit t(79)       L*        -1.0214        0.1551
 Modified inv. chi-squared Pm         1.0712        0.1420
------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
------------------------------------------------------------------------

. xtunitroot fisher lpolitical , dfuller lags(1) demean

Fisher-type unit-root test for lpolitical
Based on augmented Dickey-Fuller tests
-----------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: At least one panel is stationary        Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Not included                  Cross-sectional means removed
Drift term:   Not included                  ADF regressions: 1 lag
------------------------------------------------------------------------
                                    Statistic      p-value
------------------------------------------------------------------------
 Inverse chi-squared(30)   P         30.9020        0.4202
 Inverse normal            Z         -0.3106        0.3780
 Inverse logit t(79)       L*        -0.3236        0.3735
 Modified inv. chi-squared Pm         0.1164        0.4536
------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
```

```
. xtunitroot hadri lpolitical, kernel(bartlett 4)

Hadri LM test for lpolitical
------------------------------------------------------------
Ho: All panels are stationary              Number of panels  =     15
Ha: Some panels contain unit roots         Number of periods =     20

Time trend:         Not included           Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                  sequentially
LR variance:        Bartlett kernel, 4 lags
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                    5.6549        0.0000
------------------------------------------------------------------------------

. xtunitroot hadri lpolitical, kernel(bartlett 4) trend

Hadri LM test for lpolitical
------------------------------------------------------------
Ho: All panels are stationary              Number of panels  =     15
Ha: Some panels contain unit roots         Number of periods =     20

Time trend:         Included               Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                  sequentially
LR variance:        Bartlett kernel, 4 lags
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                    6.3497        0.0000
------------------------------------------------------------------------------

. xtunitroot hadri lpolitical, kernel(bartlett 4) trend demean

Hadri LM test for lpolitical
------------------------------------------------------------
Ho: All panels are stationary              Number of panels  =     15
Ha: Some panels contain unit roots         Number of periods =     20

Time trend:         Included               Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                  sequentially
LR variance:        Bartlett kernel, 4 lags Cross-sectional means removed
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                    6.3716        0.0000
------------------------------------------------------------------------------

. xtunitroot hadri lpolitical, kernel(bartlett 4) demean

Hadri LM test for lpolitical
------------------------------------------------------------
Ho: All panels are stationary              Number of panels  =     15
Ha: Some panels contain unit roots         Number of periods =     20

Time trend:         Not included           Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                  sequentially
LR variance:        Bartlett kernel, 4 lags Cross-sectional means removed
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                    5.6956        0.0000
------------------------------------------------------------------------------
```

Appendix 5H24: Political stability unit root test using HADRI LM

```
. xtunitroot hadri lpolitical, kernel(bartlett 4)

Hadri LM test for lpolitical
------------------------------------
Ho: All panels are stationary              Number of panels  =     15
Ha: Some panels contain unit roots         Number of periods =     20

Time trend:         Not included           Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                  sequentially
LR variance:        Bartlett kernel, 4 lags
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                    5.6549        0.0000
------------------------------------------------------------------------------

. xtunitroot hadri lpolitical, kernel(bartlett 4) trend

Hadri LM test for lpolitical
------------------------------------
Ho: All panels are stationary              Number of panels  =     15
Ha: Some panels contain unit roots         Number of periods =     20

Time trend:         Included               Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                  sequentially
LR variance:        Bartlett kernel, 4 lags
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                    6.3497        0.0000
------------------------------------------------------------------------------

. xtunitroot hadri lpolitical, kernel(bartlett 4) trend demean

Hadri LM test for lpolitical
------------------------------------
Ho: All panels are stationary              Number of panels  =     15
Ha: Some panels contain unit roots         Number of periods =     20

Time trend:         Included               Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                  sequentially
LR variance:        Bartlett kernel, 4 lags Cross-sectional means removed
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                    6.3716        0.0000
------------------------------------------------------------------------------

. xtunitroot hadri lpolitical, kernel(bartlett 4) demean

Hadri LM test for lpolitical
------------------------------------
Ho: All panels are stationary              Number of panels  =     15
Ha: Some panels contain unit roots         Number of periods =     20

Time trend:         Not included           Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                  sequentially
LR variance:        Bartlett kernel, 4 lags Cross-sectional means removed
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 z                    5.6956        0.0000
------------------------------------------------------------------------------
```

Appendix 5H25: Voice and accountability unit root test using LLC (Levin-Lin and Chu)

```
. xtunitroot llc lvoice

Levin-Lin-Chu unit-root test for lvoice
---------------------------------------
Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -7.4227
 Adjusted t*         -2.8149        0.0024
------------------------------------------------------------------------------
```

```
. xtunitroot llc lvoice, demean

Levin-Lin-Chu unit-root test for lvoice
---------------------------------------
Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included              Cross-sectional means removed

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -7.9661
 Adjusted t*         -2.9726        0.0015
```

```
. xtunitroot llc lvoice,demean trend

Levin-Lin-Chu unit-root test for lvoice
---------------------------------------
Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included                  Cross-sectional means removed

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -8.8311
 Adjusted t*         -3.2272        0.0006
------------------------------------------------------------------------------
```

```
. xtunitroot llc lvoice,trend

Levin-Lin-Chu unit-root test for lvoice
---------------------------------------
Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 Unadjusted t        -8.2821
 Adjusted t*         -2.8205        0.0024
------------------------------------------------------------------------------
```

```
. xtunitroot llc lvoice, lags(aic 4)

Levin-Lin-Chu unit-root test for lvoice

Ho: Panels contain unit roots                    Number of panels  =     15
Ha: Panels are stationary                        Number of periods =     20

AR parameter: Common                             Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1.33 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                    Statistic      p-value

 Unadjusted t        -8.7438
 Adjusted t*         -3.3817        0.0004

. xtunitroot llc lvoice,trend lags(aic 10)

Levin-Lin-Chu unit-root test for lvoice

Ho: Panels contain unit roots                    Number of panels  =     15
Ha: Panels are stationary                        Number of periods =     20

AR parameter: Common                             Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included

ADF regressions: 4.87 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                    Statistic      p-value

 Unadjusted t        -8.0260
 Adjusted t*          2.2824        0.9888

. xtunitroot llc lvoice,trend demean lags(aic 4)

Levin-Lin-Chu unit-root test for lvoice

Ho: Panels contain unit roots                    Number of panels  =     15
Ha: Panels are stationary                        Number of periods =     20

AR parameter: Common                             Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Included                           Cross-sectional means removed

ADF regressions: 1.87 lags average (chosen by AIC)
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                    Statistic      p-value

 Unadjusted t        -9.5073
 Adjusted t*         -3.3098        0.0005

. xtunitroot llc lvoice if numbcountry==1

Levin-Lin-Chu unit-root test for lvoice

Ho: Panels contain unit roots                    Number of panels  =      1
Ha: Panels are stationary                        Number of periods =     20

AR parameter: Common                             Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                    Statistic      p-value

 Unadjusted t        -3.3021
 Adjusted t*         -2.2454        0.0124

. xtunitroot llc lvoice if numbcountry==2

Levin-Lin-Chu unit-root test for lvoice

Ho: Panels contain unit roots                    Number of panels  =      1
Ha: Panels are stationary                        Number of periods =     20

AR parameter: Common                             Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                    Statistic      p-value

 Unadjusted t        -3.1137
 Adjusted t*         -2.0574        0.0198

. xtunitroot llc lvoice if numbcountry==3

Levin-Lin-Chu unit-root test for lvoice

Ho: Panels contain unit roots                    Number of panels  =      1
Ha: Panels are stationary                        Number of periods =     20

AR parameter: Common                             Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 8.00 lags average (chosen by LLC)

                    Statistic      p-value

 Unadjusted t        -1.3916
 Adjusted t*          0.1407        0.5560
```

Appendix 5H26: Voice and accountability unit root test using Harris Tzavalis

```
. xtunitroot ht lvoice

Harris-Tzavalis unit-root test for lvoice
-----------------------------------------
Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Not included
------------------------------------------------------------------------------
                    Statistic           z         p-value
------------------------------------------------------------------------------
 rho                  0.8021       -1.4407        0.0748
------------------------------------------------------------------------------

. xtunitroot ht lvoice , demean

Harris-Tzavalis unit-root test for lvoice
-----------------------------------------
Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Not included                  Cross-sectional means removed
------------------------------------------------------------------------------
                    Statistic           z         p-value
------------------------------------------------------------------------------
 rho                  0.7857       -1.8708        0.0307
------------------------------------------------------------------------------

. xtunitroot ht lvoice,demean trend

Harris-Tzavalis unit-root test for lvoice
-----------------------------------------
Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included                      Cross-sectional means removed
------------------------------------------------------------------------------
                    Statistic           z         p-value
------------------------------------------------------------------------------
 rho                  0.7201        1.1196        0.8686
------------------------------------------------------------------------------

. xtunitroot ht lvoice,trend

Harris-Tzavalis unit-root test for lvoice
-----------------------------------------
Ho: Panels contain unit roots               Number of panels  =     15
Ha: Panels are stationary                   Number of periods =     20

AR parameter: Common                        Asymptotics: N -> Infinity
Panel means:  Included                                   T Fixed
Time trend:   Included
------------------------------------------------------------------------------
                    Statistic           z         p-value
------------------------------------------------------------------------------
 rho                  0.7171        1.0633        0.8562
------------------------------------------------------------------------------
```

```
. xtunitroot ht lvoice if numbcountry==1

Harris-Tzavalis unit-root test for lvoice

Ho: Panels contain unit roots                  Number of panels  =      1
Ha: Panels are stationary                      Number of periods =     20

AR parameter: Common                           Asymptotics: N -> Infinity
Panel means:  Included                                      T Fixed
Time trend:   Not included

                     Statistic           z           p-value

 rho                   0.3448      -3.4636        0.0003
```

```
. xtunitroot ht lvoice if numbcountry==2

Harris-Tzavalis unit-root test for lvoice

Ho: Panels contain unit roots                  Number of panels  =      1
Ha: Panels are stationary                      Number of periods =     20

AR parameter: Common                           Asymptotics: N -> Infinity
Panel means:  Included                                      T Fixed
Time trend:   Not included

                     Statistic           z           p-value

 rho                   0.6389      -1.4756        0.0700
```

```
. xtunitroot ht lvoice  if numbcountry==3

Harris-Tzavalis unit-root test for lvoice

Ho: Panels contain unit roots                  Number of panels  =      1
Ha: Panels are stationary                      Number of periods =     20

AR parameter: Common                           Asymptotics: N -> Infinity
Panel means:  Included                                      T Fixed
Time trend:   Not included

                     Statistic           z           p-value

 rho                   0.7494      -0.7282        0.2333
```

```
. xtunitroot ht lvoice if numbcountry==7

Harris-Tzavalis unit-root test for lvoice

Ho: Panels contain unit roots                  Number of panels  =      1
Ha: Panels are stationary                      Number of periods =     20

AR parameter: Common                           Asymptotics: N -> Infinity
Panel means:  Included                                      T Fixed
Time trend:   Not included

                     Statistic           z           p-value

 rho                   0.5013      -2.4059        0.0081
```

```
. xtunitroot ht lvoice if numbcountry==8

Harris-Tzavalis unit-root test for lvoice

Ho: Panels contain unit roots                  Number of panels  =      1
Ha: Panels are stationary                      Number of periods =     20

AR parameter: Common                           Asymptotics: N -> Infinity
Panel means:  Included                                      T Fixed
Time trend:   Not included

                     Statistic           z           p-value

 rho                   0.9639       0.7220        0.7649
```

```
. xtunitroot ht lvoice if numbcountry==9

Harris-Tzavalis unit-root test for lvoice

Ho: Panels contain unit roots                  Number of panels  =      1
Ha: Panels are stationary                      Number of periods =     20

AR parameter: Common                           Asymptotics: N -> Infinity
Panel means:  Included                                      T Fixed
Time trend:   Not included

                     Statistic           z           p-value

 rho                   0.8533      -0.0258        0.4897
```

Appendix 5H27: Voice and accountability unit root test using breitung

```
. xtunitroot breitung lvoice,trend robust

Breitung unit-root test for lvoice
----------------------------------
Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Included                  Prewhitening: Not performed
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 lambda*              0.0831        0.5331
------------------------------------------------------------------------------
 * Lambda robust to cross-sectional correlation

. xtunitroot breitung lvoice, demean

Breitung unit-root test for lvoice
----------------------------------
Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Not included              Prewhitening: Not performed
                                        Cross-sectional means removed
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 lambda              -1.2011        0.1149
------------------------------------------------------------------------------

. xtunitroot breitung lvoice,demean trend

Breitung unit-root test for lvoice
----------------------------------
Ho: Panels contain unit roots           Number of panels  =     15
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                  sequentially
Time trend:   Included                  Prewhitening: Not performed
                                        Cross-sectional means removed
------------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------------
 lambda               0.7847        0.7837
------------------------------------------------------------------------------
```

```
. xtunitroot breitung lvoice,trend

Breitung unit-root test for lvoice
-----------------------------------
Ho: Panels contain unit roots            Number of panels  =     15
Ha: Panels are stationary                Number of periods =     20

AR parameter: Common                     Asymptotics:  T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Included                   Prewhitening: Not performed
------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------
 lambda               0.8735       0.8088
------------------------------------------------------------------------

. xtunitroot breitung lvoice

Breitung unit-root test for lvoice
-----------------------------------
Ho: Panels contain unit roots            Number of panels  =     15
Ha: Panels are stationary                Number of periods =     20

AR parameter: Common                     Asymptotics:  T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Not included               Prewhitening: Not performed
------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------
 lambda              -0.1868       0.4259
```

```
. xtunitroot breitung lvoice if numbcountry==1, robust

Breitung unit-root test for lvoice
-----------------------------------
Ho: Panels contain unit roots            Number of panels  =      1
Ha: Panels are stationary                Number of periods =     20

AR parameter: Common                     Asymptotics:  T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Not included               Prewhitening: Not performed
------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------
 lambda*             -1.8236       0.0341
------------------------------------------------------------------------
 * Lambda robust to cross-sectional correlation

. xtunitroot breitung lvoice if numbcountry==1,trend

Breitung unit-root test for lvoice
-----------------------------------
Ho: Panels contain unit roots            Number of panels  =      1
Ha: Panels are stationary                Number of periods =     20

AR parameter: Common                     Asymptotics:  T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Included                   Prewhitening: Not performed
------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------
 lambda              -1.6676       0.0477
------------------------------------------------------------------------
```

```
. xtunitroot breitung lvoice if numbcountry==3, robust

Breitung unit-root test for lvoice
----------------------------------
Ho: Panels contain unit roots           Number of panels  =      1
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Not included              Prewhitening: Not performed
------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------
 lambda*            -1.2956        0.0976
------------------------------------------------------------------------
 * Lambda robust to cross-sectional correlation

. xtunitroot breitung  lvoice if numbcountry==3,trend

Breitung unit-root test for lvoice
----------------------------------
Ho: Panels contain unit roots           Number of panels  =      1
Ha: Panels are stationary               Number of periods =     20

AR parameter: Common                    Asymptotics:  T,N -> Infinity
Panel means:  Included                                   sequentially
Time trend:   Included                  Prewhitening: Not performed
------------------------------------------------------------------------
                   Statistic      p-value
------------------------------------------------------------------------
 lambda             -0.5232        0.3004
------------------------------------------------------------------------
```

Appendix 5H28: Voice and accountability unit root test using IM PEARSON SHIN

```
. xtunitroot ips lvoice

Im-Pesaran-Shin unit-root test for lvoice

Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                       sequentially
Time trend:   Not included

ADF regressions: No lags included

                                              Fixed-N exact critical values
                  Statistic      p-value          1%        5%       10%

 t-bar             -1.6427                     -2.080    -1.910    -1.820
 t-tilde-bar       -1.4829
 Z-t-tilde-bar     -0.4425       0.3290
```

```
. xtunitroot ips lvoice, demean

Im-Pesaran-Shin unit-root test for lvoice

Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                       sequentially
Time trend:   Not included                  Cross-sectional means removed

ADF regressions: No lags included

                                              Fixed-N exact critical values
                  Statistic      p-value          1%        5%       10%

 t-bar             -1.7870                     -2.080    -1.910    -1.820
 t-tilde-bar       -1.6177
 Z-t-tilde-bar     -1.1212       0.1311
```

```
. xtunitroot ips lvoice,demean trend

Im-Pesaran-Shin unit-root test for lvoice

Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                       sequentially
Time trend:   Included                      Cross-sectional means removed

ADF regressions: No lags included

                                              Fixed-N exact critical values
                  Statistic      p-value          1%        5%       10%

 t-bar             -1.9689                     -2.710    -2.550    -2.460
 t-tilde-bar       -1.7403
 Z-t-tilde-bar     -1.7382       0.0411
```

```
. xtunitroot ips lvoice,trend

Im-Pesaran-Shin unit-root test for lvoice

Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                       sequentially
Time trend:   Included

ADF regressions: No lags included

                                              Fixed-N exact critical values
                  Statistic      p-value          1%        5%       10%

 t-bar             -1.9619                     -2.710    -2.550    -2.460
 t-tilde-bar       -1.7412
 Z-t-tilde-bar     -1.7428       0.0407
```

```
. xtunitroot ips lvoice, lags(4)

Im-Pesaran-Shin unit-root test for lvoice
-----------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Not included

ADF regressions: 4 lags
------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------
 W-t-bar             -0.8294        0.2034
------------------------------------------------------------------------

. xtunitroot ips lvoice,trend lags(4)

Im-Pesaran-Shin unit-root test for lvoice
-----------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Included

ADF regressions: 4 lags
------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------
 W-t-bar             -0.1201        0.4522
------------------------------------------------------------------------

. xtunitroot ips lvoice,trend demean lags(4)

Im-Pesaran-Shin unit-root test for lvoice
-----------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Included                      Cross-sectional means removed

ADF regressions: 4 lags
------------------------------------------------------------------------
                    Statistic      p-value
------------------------------------------------------------------------
 W-t-bar             -0.6790        0.2486
```

```
. xtunitroot ips lvoice if numbcountry==1

Im-Pesaran-Shin unit-root test for lvoice
-----------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------
                                             Fixed-N exact critical values
                    Statistic      p-value        1%       5%      10%
------------------------------------------------------------------------
 t-bar               -2.9276                   -2.500   -2.190   -2.040
 t-tilde-bar         -2.4563
 Z-t-tilde-bar       -1.3793        0.0839
------------------------------------------------------------------------

. xtunitroot ips lvoice if numbcountry==1, trend

Im-Pesaran-Shin unit-root test for lvoice
-----------------------------------------
Ho: All panels contain unit roots           Number of panels  =      1
Ha: Some panels are stationary              Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T,N -> Infinity
Panel means:  Included                                     sequentially
Time trend:   Included

ADF regressions: No lags included
------------------------------------------------------------------------
                                             Fixed-N exact critical values
                    Statistic      p-value        1%       5%      10%
------------------------------------------------------------------------
 t-bar               -2.8757                   -3.130   -2.820   -2.670
 t-tilde-bar         -2.4753
 Z-t-tilde-bar       -1.4040        0.0802
------------------------------------------------------------------------
```

```
. xtunitroot ips lvoice if numbcountry==12

Im-Pesaran-Shin unit-root test for lvoice
-----------------------------------------
Ho: All panels contain unit roots            Number of panels  =      1
Ha: Some panels are stationary               Number of periods =     20

AR parameter: Panel-specific                 Asymptotics: T,N -> Infinity
Panel means:  Included                                         sequentially
Time trend:   Not included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                                Fixed-N exact critical values
                    Statistic      p-value          1%       5%       10%
------------------------------------------------------------------------------
 t-bar               -3.4900                     -2.500   -2.190   -2.040
 t-tilde-bar         -2.7411
 Z-t-tilde-bar       -1.7495        0.0401
------------------------------------------------------------------------------

. xtunitroot ips lvoice if numbcountry==12, trend

Im-Pesaran-Shin unit-root test for lvoice
-----------------------------------------
Ho: All panels contain unit roots            Number of panels  =      1
Ha: Some panels are stationary               Number of periods =     20

AR parameter: Panel-specific                 Asymptotics: T,N -> Infinity
Panel means:  Included                                         sequentially
Time trend:   Included

ADF regressions: No lags included
------------------------------------------------------------------------------
                                                Fixed-N exact critical values
                    Statistic      p-value          1%       5%       10%
------------------------------------------------------------------------------
 t-bar               -3.0310                     -3.130   -2.820   -2.670
 t-tilde-bar         -2.4390
 Z-t-tilde-bar       -1.3569        0.0874
------------------------------------------------------------------------------
```

Appendix 5H29: Voice and accountability unit root test using FISHER

```
. xtunitroot fisher lvoice, dfuller lags(1)

Fisher-type unit-root test for lvoice
Based on augmented Dickey-Fuller tests
--------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: At least one panel is stationary        Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Not included
Drift term:   Not included                  ADF regressions: 1 lag
------------------------------------------------------------------------------
                                  Statistic      p-value
------------------------------------------------------------------------------
 Inverse chi-squared(30)   P        49.3621       0.0144
 Inverse normal            Z        -1.9581       0.0251
 Inverse logit t(79)       L*       -2.0459       0.0220
 Modified inv. chi-squared Pm        2.4996       0.0062
------------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
------------------------------------------------------------------------------

. xtunitroot fisher lvoice, dfuller lags(7) trend

Fisher-type unit-root test for lvoice
Based on augmented Dickey-Fuller tests
--------------------------------------
Ho: All panels contain unit roots           Number of panels  =     15
Ha: At least one panel is stationary        Number of periods =     20

AR parameter: Panel-specific                Asymptotics: T -> Infinity
Panel means:  Included
Time trend:   Included
Drift term:   Not included                  ADF regressions: 7 lags
------------------------------------------------------------------------------
                                  Statistic      p-value
------------------------------------------------------------------------------
 Inverse chi-squared(30)   P        39.1838       0.1217
 Inverse normal            Z         1.2260       0.8899
 Inverse logit t(79)       L*        1.0124       0.8428
 Modified inv. chi-squared Pm        1.1856       0.1179
------------------------------------------------------------------------------
 P statistic requires number of panels to be finite.
 Other statistics are suitable for finite or infinite number of panels.
------------------------------------------------------------------------------
```

Appendix 5H30: Voice and accountability unit root test using HADRI LM

```
. xtunitroot hadri lvoice, kernel(bartlett 4)

Hadri LM test for lvoice
------------------------
Ho: All panels are stationary              Number of panels  =     15
Ha: Some panels contain unit roots         Number of periods =     20

Time trend:          Not included          Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                  sequentially
LR variance:         Bartlett kernel, 4 lags
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 z                     4.4289        0.0000
------------------------------------------------------------------------------

. xtunitroot hadri lvoice, kernel(bartlett 4) trend

Hadri LM test for lvoice
------------------------
Ho: All panels are stationary              Number of panels  =     15
Ha: Some panels contain unit roots         Number of periods =     20

Time trend:          Included              Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                  sequentially
LR variance:         Bartlett kernel, 4 lags
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 z                     5.3183        0.0000
------------------------------------------------------------------------------

. xtunitroot hadri lvoice, kernel(bartlett 4) trend demean

Hadri LM test for lvoice
------------------------
Ho: All panels are stationary              Number of panels  =     15
Ha: Some panels contain unit roots         Number of periods =     20

Time trend:          Included              Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                  sequentially
LR variance:         Bartlett kernel, 4 lags Cross-sectional means removed
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 z                     5.2482        0.0000
------------------------------------------------------------------------------

. xtunitroot hadri lvoice, kernel(bartlett 4) demean

Hadri LM test for lvoice
------------------------
Ho: All panels are stationary              Number of panels  =     15
Ha: Some panels contain unit roots         Number of periods =     20

Time trend:          Not included          Asymptotics: T, N -> Infinity
Heteroskedasticity: Robust                                  sequentially
LR variance:         Bartlett kernel, 4 lags Cross-sectional means removed
------------------------------------------------------------------------------
                     Statistic      p-value
------------------------------------------------------------------------------
 z                     3.3020        0.0005
------------------------------------------------------------------------------
```

Appendix 5I: Hausman test to use fixed or random effect

```
. hausman fe re

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |       fe           re         Difference          S.E.
-------------+----------------------------------------------------------------
       regim |    .2010941    -.6151777        .8162718               .
        lhdi |    .0046808    -.0132446        .0179254        .0041383
      lstate |   -.0034302     .0243008        -.027731         .001064
       lfdig |    .0016296     .0038597       -.0022301               .
   lregtrade |   -.0006825     .0008459       -.0015283         .000575
------------------------------------------------------------------------------
                          b = consistent under Ho and Ha; obtained from xtreg
           B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =      215.57
                Prob>chi2 =      0.0000
                (V_b-V_B is not positive definite)
```

Appendix 5J: Breusch Pegan test for random or fixed effect

```
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        lregq[country_n,t] = Xb + u[country_n] + e[country_n,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+-----------------------------
                   lregq |   .0003686       .0191995
                       e |   .0000797       .0089262
                       u |          0              0

        Test:   Var(u) = 0
                             chi2(1) =   321.53
                         Prob > chi2 =     0.0000
```

Results show we use random effect. Null hypothesis is that variances across entities is zero or more specifically that there is no significant difference across units (no panel effect).

Appendix 5K: Ben-David Convergence test

Appendix 5K1: Regulatory Quality

```
. xtreg difregul diflagregq, re robust

Random-effects GLS regression                   Number of obs      =       285
Group variable: country_n                       Number of groups   =        15

R-sq:  within  = 0.7253                         Obs per group: min =        19
       between = 0.9970                                        avg =      19.0
       overall = 0.9405                                        max =        19

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   7520.57
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                            (Std. Err. adjusted for 15 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
    difregul |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  diflagregq |   .9465108   .0109144    86.72   0.000      .925119    .9679027
       _cons |   .0002803    .000358     0.78   0.434    -.0004214     .000982
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .00528049
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls difregul diflagregq

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       285
Estimated autocorrelations =         0          Number of groups   =        15
Estimated coefficients     =         2          Time periods       =        19
                                                Wald chi2(1)       =   4501.12
Log likelihood             =  1078.346          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    difregul |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  diflagregq |   .9465108    .014108    67.09   0.000     .9188597     .974162
       _cons |   .0002803   .0003259     0.86   0.390    -.0003585    .0009191
------------------------------------------------------------------------------
```

```
. xtreg difregul diflagregq if zone==1, re robust

Random-effects GLS regression                   Number of obs      =       152
Group variable: country_n                       Number of groups   =         8

R-sq:  within  = 0.6081                         Obs per group: min =        19
       between = 0.9979                                        avg =      19.0
       overall = 0.9150                                        max =        19

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   1296.78
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                             (Std. Err. adjusted for 8 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
    difregul |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  diflagregq |   .9530995   .0264671    36.01   0.000      .901225    1.004974
       _cons |  -.0001776   .0005072    -0.35   0.726    -.0011717    .0008165
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .00452589
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls difregul diflagregq if zone==1

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       152
Estimated autocorrelations =         0          Number of groups   =         8
Estimated coefficients     =         2          Time periods       =        19
                                                Wald chi2(1)       =   1637.26
Log likelihood             =  593.4986          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    difregul |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  diflagregq |   .9530995   .0235548    40.46   0.000     .9069328    .9992661
       _cons |  -.0001776   .0004091    -0.43   0.664    -.0009794    .0006242
------------------------------------------------------------------------------
```

```
. xtreg difregul diflagregq if zone==0, re robust

Random-effects GLS regression                   Number of obs      =       133
Group variable: country_n                       Number of groups   =         7

R-sq:  within  = 0.7741                         Obs per group: min =        19
       between = 0.9983                                        avg =      19.0
       overall = 0.9493                                        max =        19

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   8417.97
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                              (Std. Err. adjusted for 7 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
    difregul |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  diflagregq |   .9498014   .0103521    91.75   0.000     .9295117    .9700912
       _cons |   .0007869   .0005275     1.49   0.136     -.000247    .0018208
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .00598635
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls difregul diflagregq if zone==0

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       133
Estimated autocorrelations =         0          Number of groups   =         7
Estimated coefficients     =         2          Time periods       =        19
                                                Wald chi2(1)       =   2491.24
Log likelihood             =  489.4661          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    difregul |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  diflagregq |   .9498014   .0190294    49.91   0.000     .9125045    .9870983
       _cons |   .0007869   .0005379     1.46   0.143    -.0002673    .0018411
------------------------------------------------------------------------------
```

Appendix 5K2: Corruption Perception

```
. xtreg difcorrupt diflcorrupt, re robust

Random-effects GLS regression                   Number of obs      =       285
Group variable: country_n                       Number of groups   =        15

R-sq:  within  = 0.7427                         Obs per group: min =        19
       between = 0.9948                                        avg =      19.0
       overall = 0.9257                                        max =        19

Random effects u_i ~ Gaussian                   Wald chi2(1)       =    847.78
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                            (Std. Err. adjusted for 15 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
  difcorrupt |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 diflcorrupt |   .9468143    .032518    29.12   0.000     .8830802    1.010548
       _cons |   .0000311   .0006061     0.05   0.959    -.0011569    .0012191
-------------+----------------------------------------------------------------
     sigma_u |  .00087133
     sigma_e |  .00613665
         rho |  .01976209   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls difcorrupt diflcorrupt

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       285
Estimated autocorrelations =         0          Number of groups   =        15
Estimated coefficients     =         2          Time periods       =        19
                                                Wald chi2(1)       =   3549.15
Log likelihood             =  1023.986          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
  difcorrupt |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 diflcorrupt |   .9628546   .0161621    59.57   0.000     .9311774    .9945318
       _cons |   .0000311   .0003944     0.08   0.937    -.0007419    .0008041
------------------------------------------------------------------------------
```

```
. xtreg difcorrupt diflcorrupt if zone==1,re robust

Random-effects GLS regression                   Number of obs      =       152
Group variable: country_n                       Number of groups   =         8

R-sq:  within  = 0.6382                         Obs per group: min =        19
       between = 0.9949                                        avg =      19.0
       overall = 0.8610                                        max =        19

Random effects u_i ~ Gaussian                   Wald chi2(1)       =    564.39
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                             (Std. Err. adjusted for 8 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
  difcorrupt |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 diflcorrupt |   .9057805    .038127    23.76   0.000      .831053     .980508
       _cons |  -.0005417   .0006501    -0.83   0.405    -.0018159    .0007325
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .00641736
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls difcorrupt diflcorrupt if zone==1

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       152
Estimated autocorrelations =         0          Number of groups   =         8
Estimated coefficients     =         2          Time periods       =        19
                                                Wald chi2(1)       =    941.85
Log likelihood             =  545.1011          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
  difcorrupt |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 diflcorrupt |   .9057805   .0295142    30.69   0.000     .8479337    .9636273
       _cons |  -.0005417   .0005449    -0.99   0.320    -.0016097    .0005263
```

```
. xtreg difcorrupt diflcorrupt if zone==0,re robust

Random-effects GLS regression                   Number of obs      =       133
Group variable: country_n                       Number of groups   =         7

R-sq:  within  = 0.8197                         Obs per group: min =        19
       between = 0.9957                                        avg =      19.0
       overall = 0.9542                                        max =        19

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   1176.61
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                             (Std. Err. adjusted for 7 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
  difcorrupt |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 diflcorrupt |   .9447449   .0275422    34.30   0.000     .8907632    .9987267
       _cons |   .0006314    .001184     0.53   0.594    -.0016892    .0029521
-------------+----------------------------------------------------------------
     sigma_u |  .00162326
     sigma_e |  .00577102
         rho |  .07331686   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls difcorrupt diflcorrupt if zone==0

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       133
Estimated autocorrelations =         0          Number of groups   =         7
Estimated coefficients     =         2          Time periods       =        19
                                                Wald chi2(1)       =   2771.77
Log likelihood             =  482.6042          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
  difcorrupt |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 diflcorrupt |     .98618   .0187317    52.65   0.000     .9494665    1.022893
       _cons |   .0005737   .0005577     1.03   0.304    -.0005195    .0016668
------------------------------------------------------------------------------
```

Appendix 5K3: Rule of Law

```
. xtreg difrule diflrule, re robust

Random-effects GLS regression                   Number of obs      =       285
Group variable: country_n                       Number of groups   =        15

R-sq:  within  = 0.7852                         Obs per group: min =        19
       between = 0.9986                                        avg =      19.0
       overall = 0.9663                                        max =        19

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   8487.99
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                             (Std. Err. adjusted for 15 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
     difrule |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    diflrule |   .9547991   .0103636    92.13   0.000     .9344869    .9751114
       _cons |   .0003193   .0003127     1.02   0.307    -.0002936    .0009322
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .00557368
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtgls difrule diflrule

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       285
Estimated autocorrelations =         0          Number of groups   =        15
Estimated coefficients     =         2          Time periods       =        19
                                                Wald chi2(1)       =   8179.81
Log likelihood             =   1070.597         Prob > chi2        =    0.0000

------------------------------------------------------------------------------
     difrule |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    diflrule |   .9547991    .010557    90.44   0.000     .9341078    .9754904
       _cons |   .0003193   .0003349     0.95   0.340    -.0003371    .0009757
```

```
. xtreg difrule diflrule if zone==1,re robust

Random-effects GLS regression                   Number of obs      =       152
Group variable: country_n                       Number of groups   =         8

R-sq:  within  = 0.7533                         Obs per group: min =        19
       between = 0.9986                                        avg =      19.0
       overall = 0.9467                                        max =        19

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   4974.31
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                              (Std. Err. adjusted for 8 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
     difrule |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    diflrule |   .9455204   .0134062    70.53   0.000     .9192448    .9717959
       _cons |   .0001475   .0003669     0.40   0.688    -.0005715    .0008666
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .00525984
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtgls difrule diflrule if zone==1

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       152
Estimated autocorrelations =         0          Number of groups   =         8
Estimated coefficients     =         2          Time periods       =        19
                                                Wald chi2(1)       =   2700.42
Log likelihood             =   580.3718         Prob > chi2        =    0.0000

------------------------------------------------------------------------------
     difrule |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    diflrule |   .9455204   .0181951    51.97   0.000     .9098586    .9811821
       _cons |   .0001475   .0004311     0.34   0.732    -.0006974    .0009925
```

```
. xtreg difrule diflrule if zone==0,re robust

Random-effects GLS regression                   Number of obs      =       133
Group variable: country_n                       Number of groups   =         7

R-sq:  within  = 0.8081                         Obs per group: min =        19
       between = 0.9987                                        avg =      19.0
       overall = 0.9748                                        max =        19

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   5548.08
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                              (Std. Err. adjusted for 7 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
     difrule |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    diflrule |    .956084   .0128359    74.49   0.000     .9309262    .9812418
       _cons |   .0005162   .0005715     0.90   0.366    -.0006039    .0016363
-------------+----------------------------------------------------------------
     sigma_u |  .00071889
     sigma_e |   .0059237
         rho |   .0145141   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls difrule diflrule if zone==0

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       133
Estimated autocorrelations =         0          Number of groups   =         7
Estimated coefficients     =         2          Time periods       =        19
                                                Wald chi2(1)       =   5135.99
Log likelihood             =  491.5999          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
     difrule |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    diflrule |   .9587444    .013378    71.67   0.000      .932524    .9849648
       _cons |   .0005163   .0005207     0.99   0.321    -.0005042    .0015369
------------------------------------------------------------------------------
```

Appendix 5K4: Political Stability

```
. xtreg difpolitical diflpolitical , re robust

Random-effects GLS regression                   Number of obs      =       285
Group variable: country_n                       Number of groups   =        15

R-sq:  within  = 0.7368                         Obs per group: min =        19
       between = 0.9945                                        avg =      19.0
       overall = 0.9105                                        max =        19

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   2667.50
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                             (Std. Err. adjusted for 15 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
difpolitical |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
diflpoliti~l |   .9375555   .0181528    51.65   0.000     .9019766    .9731345
       _cons |   .0000328   .0008234     0.04   0.968     -.001581    .0016465
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .01307494
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtreg difpolitical diflpolitical if zone==1,re robust

Random-effects GLS regression                   Number of obs      =       152
Group variable: country_n                       Number of groups   =         8

R-sq:  within  = 0.7083                         Obs per group: min =        19
       between = 0.9903                                        avg =      19.0
       overall = 0.8504                                        max =        19

Random effects u_i ~ Gaussian                   Wald chi2(1)       =    842.71
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                              (Std. Err. adjusted for 8 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
difpolitical |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
diflpoliti~l |   .9092918    .031323    29.03   0.000     .8478998    .9706837
       _cons |   -.000512   .0012304    -0.42   0.677    -.0029235    .0018996
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .01347619
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtgls difpolitical diflpolitical

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       285
Estimated autocorrelations =         0          Number of groups   =        15
Estimated coefficients     =         2          Time periods       =        19
                                                Wald chi2(1)       =   2900.92
Log likelihood             =  827.9042          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
difpolitical |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
diflpoliti~l |   .9375555   .0174072    53.86   0.000      .903438     .971673
       _cons |   .0000328   .0007848     0.04   0.967    -.0015054    .0015709
```

```
. xtgls difpolitical diflpolitical if zone==1

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       152
Estimated autocorrelations =         0          Number of groups   =         8
Estimated coefficients     =         2          Time periods       =        19
                                                Wald chi2(1)       =    864.21
Log likelihood             =  438.4281          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
difpolitical |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
diflpoliti~l |   .9092918   .0309311    29.40   0.000      .848668    .9699155
       _cons |   -.000512   .0011082    -0.46   0.644     -.002684    .0016601
------------------------------------------------------------------------------
```

```
. xtreg difpolitical diflpolitical if zone==0,re robust

Random-effects GLS regression                   Number of obs      =       133
Group variable: country_n                       Number of groups   =         7

R-sq:  within  = 0.7668                         Obs per group: min =        19
       between = 0.9968                                        avg =      19.0
       overall = 0.9407                                        max =        19

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   2006.48
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                              (Std. Err. adjusted for 7 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
difpolitical |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
diflpoliti~l |    .952447    .021263    44.79   0.000     .9107724    .9941216
       _cons |   .0009072   .0011175     0.81   0.417    -.0012831    .0030975
-------------+----------------------------------------------------------------
     sigma_u |  .00098808
     sigma_e |  .01264377
         rho |  .00606998   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls difpolitical diflpolitical if zone==0

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       133
Estimated autocorrelations =         0          Number of groups   =         7
Estimated coefficients     =         2          Time periods       =        19
                                                Wald chi2(1)       =   2110.83
Log likelihood             =  390.8897          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
difpolitical |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
diflpoliti~l |   .9548073   .0207821    45.94   0.000     .9140751    .9955394
       _cons |    .000921   .0011169     0.82   0.410    -.0012681    .0031101
------------------------------------------------------------------------------
```

Appendix 5K5: Voice and Accountability

```
. xtreg difvoice diflvoice, re robust

Random-effects GLS regression                   Number of obs      =       285
Group variable: country_n                       Number of groups   =        15

R-sq:  within  = 0.7047                         Obs per group: min =        19
       between = 0.9979                                        avg =      19.0
       overall = 0.9337                                        max =        19

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   2668.04
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                             (Std. Err. adjusted for 15 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
    difvoice |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   diflvoice |   .9503359   .0183984    51.65   0.000     .9142756    .9863961
       _cons |   .0007755   .0004755     1.63   0.103    -.0001565    .0017075
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .00812406
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtgls difvoice diflvoice

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       285
Estimated autocorrelations =         0          Number of groups   =        15
Estimated coefficients     =         2          Time periods       =        19
                                                Wald chi2(1)       =   4014.21
Log likelihood             =  957.8383          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    difvoice |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   diflvoice |   .9503359   .0149995    63.36   0.000     .9209374    .9797344
       _cons |   .0007755   .0004974     1.56   0.119    -.0001995    .0017505
------------------------------------------------------------------------------
```

```
. xtreg difvoice diflvoice if zone==1,re robust

Random-effects GLS regression                   Number of obs      =       152
Group variable: country_n                       Number of groups   =         8

R-sq:  within  = 0.6352                         Obs per group: min =        19
       between = 0.9974                                        avg =      19.0
       overall = 0.9119                                        max =        19

Random effects u_i ~ Gaussian                   Wald chi2(1)       =    744.41
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                              (Std. Err. adjusted for 8 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
    difvoice |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   diflvoice |   .9331571   .0342018    27.28   0.000     .8661229    1.000191
       _cons |   .0005793   .0007132     0.81   0.417    -.0008185    .0019771
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |   .0079454
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtgls difvoice diflvoice if zone==1

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       152
Estimated autocorrelations =         0          Number of groups   =         8
Estimated coefficients     =         2          Time periods       =        19
                                                Wald chi2(1)       =   1572.36
Log likelihood             =  512.2152          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    difvoice |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   diflvoice |   .9331571   .0235331    39.65   0.000     .8870331    .9792811
       _cons |   .0005793   .0006751     0.86   0.391    -.0007438    .0019024
```

```
. xtreg difvoice diflvoice if zone==0,re robust

Random-effects GLS regression                   Number of obs      =       133
Group variable: country_n                       Number of groups   =         7

R-sq:  within  = 0.7574                         Obs per group: min =        19
       between = 0.9983                                        avg =      19.0
       overall = 0.9483                                        max =        19

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   2787.82
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                              (Std. Err. adjusted for 7 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
    difvoice |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   diflvoice |   .9618005    .018216    52.80   0.000     .9260979    .9975032
       _cons |   .0010054   .0006937     1.45   0.147    -.0003542     .002365
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .00828503
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls difvoice diflvoice if zone==0

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       133
Estimated autocorrelations =         0          Number of groups   =         7
Estimated coefficients     =         2          Time periods       =        19
                                                Wald chi2(1)       =   2440.60
Log likelihood             =  446.1692          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    difvoice |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   diflvoice |   .9618005   .0194687    49.40   0.000     .9236426    .9999585
       _cons |   .0010054   .0007327     1.37   0.170    -.0004307    .0024415
------------------------------------------------------------------------------
```

Appendix 5L: Determinants of Institutional Quality

Appendix 5L1: Regulatory quality determinants

```
. xtreg lregq  lhdi  regin regim lstate lfdig zone lregtrade lgoveff sqlhdi, re

Random-effects GLS regression                   Number of obs      =       280
Group variable: country_n                       Number of groups   =        14

R-sq:  within  = 0.2065                         Obs per group: min =        20
       between = 0.9430                                        avg =      20.0
       overall = 0.7758                                        max =        20

Random effects u_i ~ Gaussian                   Wald chi2(9)       =    934.40
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       lregq |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        lhdi |   .0900061     .02034     4.43   0.000     .0501405    .1298716
       regin |   .3395574   .0470792     7.21   0.000     .2472839     .431831
       regim |   .1606079   .1736394     0.92   0.355    -.1797191    .5009349
      lstate |   .0045425   .0024677     1.84   0.066    -.0002941    .0093791
       lfdig |   .0025237   .0005967     4.23   0.000     .0013541    .0036932
        zone |  -.0038396    .002011    -1.91   0.056    -.0077811     .000102
   lregtrade |      .0025   .0004516     5.54   0.000     .0016148    .0033851
     lgoveff |   .5454817    .034761    15.69   0.000     .4773515     .613612
      sqlhdi |   .0565636   .0107159     5.28   0.000     .0355608    .0775664
       _cons |  -.5341219   1.037637    -0.51   0.607    -2.567852    1.499609
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .00795032
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls lregq  lhdi  regin regim lstate lfdig zone lregtrade lgoveff sqlhdi

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       280
Estimated autocorrelations =         0          Number of groups   =        14
Estimated coefficients     =        10          Time periods       =        20
                                                Wald chi2(9)       =    969.00
Log likelihood             =  919.3454          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       lregq |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        lhdi |   .0900061   .0199734     4.51   0.000     .0508588    .1291533
       regin |   .3395574   .0462308     7.34   0.000     .2489467    .4301682
       regim |   .1606079   .1705105     0.94   0.346    -.1735866    .4948024
      lstate |   .0045425   .0024232     1.87   0.061     -.000207    .0092919
       lfdig |   .0025237    .000586     4.31   0.000     .0013752    .0036721
        zone |  -.0038396   .0019748    -1.94   0.052    -.0077101     .000031
   lregtrade |      .0025   .0004435     5.64   0.000     .0016308    .0033692
     lgoveff |   .5454817   .0341346    15.98   0.000     .4785791    .6123843
      sqlhdi |   .0565636   .0105228     5.38   0.000     .0359392    .0771879
       _cons |  -.5341219   1.018939    -0.52   0.600    -2.531206    1.462962
------------------------------------------------------------------------------
```

Appendix 5L2: Corruption perception determinants

```
. xtreg  lcorrupt  lhdi   corruptin corruptim lstate lfdig zone lregtrade lgoveff sqlhdi  sqlstate, re

Random-effects GLS regression                   Number of obs      =       280
Group variable: country_n                       Number of groups   =        14

R-sq:  within  = 0.4102                         Obs per group: min =        20
       between = 0.9304                                        avg =      20.0
       overall = 0.8083                                        max =        20

Random effects u_i ~ Gaussian                   Wald chi2(10)      =   1134.32
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    lcorrupt |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        lhdi |   .1845783   .0242758     7.60   0.000     .1369986     .232158
   corruptin |   .3168463   .0369407     8.58   0.000     .2444438    .3892487
   corruptim |  -1.564223   .3147564    -4.97   0.000    -2.181134   -.9473121
      lstate |   .0807257   .0287188     2.81   0.005     .0244379    .1370136
       lfdig |   .0023023   .0006598     3.49   0.000     .0010091    .0035954
        zone |   .0028541   .0019508     1.46   0.143    -.0009693    .0066775
   lregtrade |  -.0028326    .000617    -4.59   0.000     -.004042   -.0016232
     lgoveff |    .442187   .0386932    11.43   0.000     .3663496    .5180243
      sqlhdi |   .0980078   .0126964     7.72   0.000     .0731233    .1228923
    sqlstate |   -.015459   .0057251    -2.70   0.007      -.02668   -.0042381
       _cons |   9.459583   1.833969     5.16   0.000      5.86507     13.0541
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |   .0087002
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls  lcorrupt  lhdi   corruptin corruptim lstate lfdig zone lregtrade lgoveff sqlhdi  sqlstate

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       280
Estimated autocorrelations =         0          Number of groups   =        14
Estimated coefficients     =        11          Time periods       =        20
                                                Wald chi2(10)      =   1180.70
Log likelihood             =  878.5272          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    lcorrupt |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        lhdi |   .1845783   .0237942     7.76   0.000     .1379426     .231214
   corruptin |   .3168463   .0362078     8.75   0.000     .2458803    .3878123
   corruptim |  -1.564223   .3085117    -5.07   0.000    -2.168895   -.9595514
      lstate |   .0807257    .028149     2.87   0.004     .0255547    .1358968
       lfdig |   .0023023   .0006467     3.56   0.000     .0010348    .0035698
        zone |   .0028541   .0019121     1.49   0.136    -.0008935    .0066016
   lregtrade |  -.0028326   .0006048    -4.68   0.000     -.004018   -.0016472
     lgoveff |    .442187   .0379256    11.66   0.000     .3678542    .5165197
      sqlhdi |   .0980078   .0124445     7.88   0.000      .073617    .1223986
    sqlstate |   -.015459   .0056115    -2.75   0.006    -.0264573   -.0044607
       _cons |   9.459582   1.797583     5.26   0.000     5.936384    12.98278
------------------------------------------------------------------------------
```

Appendix 5L3: Rule of law determinants

```
. xtreg lrule rulein ruleimm lhdi lstate lfdig zone lregtrade lgoveff sqlhdi, re

Random-effects GLS regression                   Number of obs      =       280
Group variable: country_n                       Number of groups   =        14

R-sq:  within  = 0.2815                         Obs per group: min =        20
       between = 0.9441                                        avg =      20.0
       overall = 0.8660                                        max =        20

Random effects u_i ~ Gaussian                   Wald chi2(9)       =   1745.20
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       lrule |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      rulein |    .361623   .0319443    11.32   0.000     .2990133    .4242327
     ruleimm |  -.9867954   .2881344    -3.42   0.001    -1.551528   -.4220624
        lhdi |   .0633168   .0250485     2.53   0.011     .0142227    .1124109
      lstate |   .0146541   .0029461     4.97   0.000     .0088798    .0204283
       lfdig |   .0018248   .0006848     2.66   0.008     .0004825     .003167
        zone |   -.004171   .0019747    -2.11   0.035    -.0080413   -.0003007
   lregtrade |   .0021756    .000557     3.91   0.000     .0010838    .0032673
     lgoveff |   .4765034   .0486016     9.80   0.000     .3812461    .5717608
      sqlhdi |   .0343813   .0128703     2.67   0.008      .009156    .0596066
       _cons |   5.994883   1.702539     3.52   0.000     2.657968    9.331797
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .00826763
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls lrule rulein ruleimm lhdi lstate lfdig zone lregtrade lgoveff sqlhdi

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       280
Estimated autocorrelations =         0          Number of groups   =        14
Estimated coefficients     =        10          Time periods       =        20
                                                Wald chi2(9)       =   1809.84
Log likelihood             =  868.3375          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       lrule |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      rulein |    .361623   .0313687    11.53   0.000     .3001415    .4231045
     ruleimm |  -.9867954   .2829423    -3.49   0.000    -1.541352   -.4322386
        lhdi |   .0633168   .0245971     2.57   0.010     .0151074    .1115262
      lstate |   .0146541    .002893     5.07   0.000     .0089839    .0203242
       lfdig |   .0018248   .0006725     2.71   0.007     .0005067    .0031429
        zone |   -.004171   .0019391    -2.15   0.031    -.0079715   -.0003704
   lregtrade |   .0021756    .000547     3.98   0.000     .0011034    .0032477
     lgoveff |   .4765034   .0477258     9.98   0.000     .3829625    .5700443
      sqlhdi |   .0343813   .0126384     2.72   0.007     .0096105    .0591521
       _cons |   5.994883    1.67186     3.59   0.000     2.718098    9.271668
------------------------------------------------------------------------------
```

Appendix 5L4: Political stability determinants

```
. xtgls lpolitical politicalin politicalim lhdi lstate lfdig zone lregtrade lgoveff sqlhdi

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       280
Estimated autocorrelations =         0          Number of groups   =        14
Estimated coefficients     =        10          Time periods       =        20
                                                Wald chi2(9)       =    469.96
Log likelihood             =  619.6421          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
  lpolitical |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 politicalin |   .2222779   .0512534     4.34   0.000     .1218231    .3227328
 politicalim |  -4.780504    .459699   -10.40   0.000    -5.681497   -3.879511
        lhdi |   .0016475   .0591961     0.03   0.978    -.1143746    .1176696
      lstate |   .0119019   .0070809     1.68   0.093    -.0019763    .0257801
       lfdig |   .0028964   .0016326     1.77   0.076    -.0003034    .0060961
        zone |  -.0036441   .0049391    -0.74   0.461    -.0133246    .0060364
   lregtrade |   .0010508   .0012933     0.81   0.417     -.001484    .0035855
     lgoveff |   .4528196   .0985739     4.59   0.000     .2596184    .6460208
      sqlhdi |   .0139453   .0308208     0.45   0.651    -.0464625     .074353
       _cons |   27.73822   2.661351    10.42   0.000     22.52207    32.95437
------------------------------------------------------------------------------

. xtreg lpolitical politicalin politicalim lhdi lstate lfdig zone lregtrade lgoveff sqlhdi, re

Random-effects GLS regression                   Number of obs      =       280
Group variable: country_n                       Number of groups   =        14

R-sq:  within  = 0.2221                         Obs per group: min =        20
       between = 0.8445                                        avg =      20.0
       overall = 0.6266                                        max =        20

Random effects u_i ~ Gaussian                   Wald chi2(9)       =    453.18
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

------------------------------------------------------------------------------
  lpolitical |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 politicalin |   .2222779   .0521939     4.26   0.000     .1199797    .3245761
 politicalim |  -4.780504   .4681345   -10.21   0.000    -5.698031   -3.862977
        lhdi |   .0016475   .0602823     0.03   0.978    -.1165037    .1197986
      lstate |   .0119019   .0072108     1.65   0.099     -.002231    .0260348
       lfdig |   .0028964   .0016625     1.74   0.081    -.0003621    .0061548
        zone |  -.0036441   .0050298    -0.72   0.469    -.0135022    .0062141
   lregtrade |   .0010508    .001317     0.80   0.425    -.0015305    .0036321
     lgoveff |   .4528196   .1003827     4.51   0.000     .2560731    .6495661
      sqlhdi |   .0139453   .0313864     0.44   0.657     -.047571    .0754615
       _cons |   27.73822   2.710187    10.23   0.000     22.42635    33.05009
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .02039695
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Appendix 5L5: Voice and accountability determinants

```
. xtgls lvoice voicein voiceimm lhdi lstate lfdig zone lregtrade lgoveff sqlhdi

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       280
Estimated autocorrelations =         0          Number of groups   =        14
Estimated coefficients     =        10          Time periods       =        20
                                                Wald chi2(9)       =    834.36
Log likelihood             =  748.5757          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      lvoice |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     voicein |   .4230043   .0406043    10.42   0.000     .3434214    .5025873
    voiceimm |   .7251611   .1996483     3.63   0.000     .3338577    1.116465
        lhdi |   .1380475    .036894     3.74   0.000     .0657365    .2103584
      lstate |   .0017494   .0048243     0.36   0.717     -.007706    .0112049
       lfdig |   .0023677   .0010242     2.31   0.021     .0003602    .0043751
        zone |   .0038571   .0029845     1.29   0.196    -.0019923    .0097065
   lregtrade |  -.0007195   .0008823    -0.82   0.415    -.0024487    .0010097
     lgoveff |   .6349075   .0615637    10.31   0.000     .5142449    .7555702
      sqlhdi |   .0809005   .0191182     4.23   0.000     .0434295    .1183715
       _cons |  -4.178184   1.229555    -3.40   0.001    -6.588066   -1.768301
------------------------------------------------------------------------------

. xtreg lvoice voicein voiceimm lhdi lstate lfdig zone lregtrade lgoveff sqlhdi, re

Random-effects GLS regression                   Number of obs      =       280
Group variable: country_n                       Number of groups   =        14

R-sq:  within  = 0.2805                         Obs per group: min =        20
       between = 0.8539                                        avg =      20.0
       overall = 0.7487                                        max =        20

Random effects u_i ~ Gaussian                   Wald chi2(9)       =    804.56
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      lvoice |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     voicein |   .4230043   .0413494    10.23   0.000      .341961    .5040476
    voiceimm |   .7251611   .2033118     3.57   0.000     .3266773    1.123645
        lhdi |   .1380475    .037571     3.67   0.000     .0644096    .2116853
      lstate |   .0017494   .0049128     0.36   0.722    -.0078795    .0113784
       lfdig |   .0023677    .001043     2.27   0.023     .0003234     .004412
        zone |   .0038571   .0030392     1.27   0.204    -.0020996    .0098139
   lregtrade |  -.0007195   .0008985    -0.80   0.423    -.0024804    .0010415
     lgoveff |   .6349075   .0626934    10.13   0.000     .5120307    .7577843
      sqlhdi |   .0809005    .019469     4.16   0.000     .0427419    .1190591
       _cons |  -4.178184   1.252117    -3.34   0.001    -6.632288   -1.724079
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .01171159
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Appendix 5M: Three- year moving Average convergence test

Appendix 5M1: Regulatory quality

```
. xtreg difregul diflagregq, re robust

Random-effects GLS regression                   Number of obs      =       254
Group variable: country_n                       Number of groups   =        15

R-sq:  within  = 0.8768                         Obs per group: min =        16
       between = 0.9967                                        avg =      16.9
       overall = 0.9778                                        max =        17

Random effects u_i ~ Gaussian                   Wald chi2(1)       =  11615.47
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                             (Std. Err. adjusted for 15 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
    difregul |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  diflagregq |   .9496567   .0088115   107.78   0.000     .9323866    .9669269
       _cons |   .0001604   .0003537     0.45   0.650     -.000533    .0008537
-------------+----------------------------------------------------------------
     sigma_u |  .00101927
     sigma_e |  .00312067
         rho |  .09639701   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls difregul diflagregq

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       254
Estimated autocorrelations =         0          Number of groups   =        15
Estimated coefficients     =         2          Obs per group: min =        16
                                                               avg =  16.93333
                                                               max =        17
                                                Wald chi2(1)       =  11190.64
Log likelihood             =  1089.784          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    difregul |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  diflagregq |   .9649588   .0091218   105.79   0.000     .9470804    .9828372
       _cons |    .000162    .000208     0.78   0.436    -.0002456    .0005696
------------------------------------------------------------------------------
```

```
. xtreg difregul diflagregq if zone==1, fe robust

Fixed-effects (within) regression               Number of obs      =       135
Group variable: country_n                       Number of groups   =         8

R-sq:  within  = 0.7979                         Obs per group: min =        16
       between = 0.9984                                        avg =      16.9
       overall = 0.9687                                        max =        17

                                                F(1,7)             =    706.26
corr(u_i, Xb)  = 0.9040                         Prob > F           =    0.0000

                              (Std. Err. adjusted for 8 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
    difregul |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  diflagregq |   .8170382   .0307439    26.58   0.000     .7443403    .8897361
       _cons |   .0002842   .0001316     2.16   0.068     -.000027    .0005954
-------------+----------------------------------------------------------------
     sigma_u |  .00322315
     sigma_e |  .00269223
         rho |  .58903444   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtregar difregul diflagregq if zone==1

RE GLS regression with AR(1) disturbances       Number of obs      =       135
Group variable: country_n                       Number of groups   =         8

R-sq:  within  = 0.7979                         Obs per group: min =        16
       between = 0.9984                                        avg =      16.9
       overall = 0.9687                                        max =        17

                                                Wald chi2(2)       =    884.30
corr(u_i, Xb)      = 0 (assumed)                Prob > chi2        =    0.0000

------------------- theta --------------------
  min      5%       median        95%      max
0.0000   0.0000     0.0000     0.0000   0.0000

------------------------------------------------------------------------------
    difregul |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  diflagregq |   .9249774   .0311051    29.74   0.000     .8640124    .9859423
       _cons |  -.0001458   .0005812    -0.25   0.802     -.001285    .0009934
-------------+----------------------------------------------------------------
      rho_ar |    .712412   (estimated autocorrelation coefficient)
     sigma_u |          0
     sigma_e |  .00212857
     rho_fov |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtreg difregul diflagregq if zone==0, re robust

Random-effects GLS regression                   Number of obs      =       102
Group variable: country_n                       Number of groups   =         6

R-sq:  within  = 0.9167                         Obs per group: min =        17
       between = 0.9969                                        avg =      17.0
       overall = 0.9804                                        max =        17

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   6341.95
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                              (Std. Err. adjusted for 6 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
    difregul |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  diflagregq |   .9522086    .011957    79.64   0.000     .9287733    .9756438
       _cons |   .0005105   .0006853     0.74   0.456    -.0008326    .0018537
-------------+----------------------------------------------------------------
     sigma_u |  .00133646
     sigma_e |  .00347918
         rho |  .12858288   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls difregul diflagregq if zone==0

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       102
Estimated autocorrelations =         0          Number of groups   =         6
Estimated coefficients     =         2          Time periods       =        17
                                                Wald chi2(1)       =   5091.97
Log likelihood             =  428.7404          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    difregul |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  diflagregq |   .9615853   .0134755    71.36   0.000     .9351738    .9879968
       _cons |   .0006026   .0003817     1.58   0.114    -.0001456    .0013508
------------------------------------------------------------------------------
```

Appendix 5M2: Corruption

```
. xtreg difcorrupt diflcorrupt, re robust

Random-effects GLS regression                   Number of obs      =       254
Group variable: country_n                       Number of groups   =        15

R-sq:  within  = 0.8875                         Obs per group: min =        16
       between = 0.9954                                        avg =      16.9
       overall = 0.9718                                        max =        17

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   1621.18
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                               (Std. Err. adjusted for 15 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
  difcorrupt |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 diflcorrupt |   .9492563   .0235759    40.26   0.000     .9030483    .9954642
       _cons |   .0000529   .0005943     0.09   0.929    -.0011118    .0012177
-------------+----------------------------------------------------------------
     sigma_u |  .00132116
     sigma_e |  .00349597
         rho |  .12496774   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtreg difcorrupt diflcorrupt if zone==1,re robust

Random-effects GLS regression                   Number of obs      =       135
Group variable: country_n                       Number of groups   =         8

R-sq:  within  = 0.8309                         Obs per group: min =        16
       between = 0.9963                                        avg =      16.9
       overall = 0.9493                                        max =        17

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   1001.24
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                                (Std. Err. adjusted for 8 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
  difcorrupt |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 diflcorrupt |   .9546356   .0301695    31.64   0.000     .8955045    1.013767
       _cons |  -.0005469   .0004452    -1.23   0.219    -.0014195    .0003257
-------------+----------------------------------------------------------------
     sigma_u |  .00050283
     sigma_e |  .00371184
         rho |  .01802074   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtgls difcorrupt diflcorrupt

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       254
Estimated autocorrelations =         0          Number of groups   =        15
Estimated coefficients     =         2          Obs per group: min =        16
                                                               avg =  16.93333
                                                               max =        17
                                                Wald chi2(1)       =   8757.72
Log likelihood             =  1040.813          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
  difcorrupt |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 diflcorrupt |   .9933597   .0106148    93.58   0.000     .9725551    1.014164
       _cons |   .0000543   .0002522     0.22   0.829      -.00044    .0005486
------------------------------------------------------------------------------
```

```
. xtgls difcorrupt diflcorrupt if zone==1

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       135
Estimated autocorrelations =         0          Number of groups   =         8
Estimated coefficients     =         2          Obs per group: min =        16
                                                               avg =    16.875
                                                               max =        17
                                                Wald chi2(1)       =   2529.24
Log likelihood             =  558.9866          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
  difcorrupt |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 diflcorrupt |   .9626602   .0191416    50.29   0.000     .9251433    1.000177
       _cons |  -.0005347   .0003327    -1.61   0.108    -.0011868    .0001173
------------------------------------------------------------------------------
```

```
. xtreg difcorrupt diflcorrupt if zone==0,re robust

Random-effects GLS regression                   Number of obs      =       102
Group variable: country_n                       Number of groups   =         6

R-sq:  within  = 0.8989                         Obs per group: min =        17
       between = 0.9931                                        avg =      17.0
       overall = 0.9670                                        max =        17

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   1116.82
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                              (Std. Err. adjusted for 6 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
  difcorrupt |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 diflcorrupt |    .917535   .0274556    33.42   0.000     .8637229     .971347
       _cons |  -.0004628   .0008534    -0.54   0.588    -.0021354    .0012099
-------------+----------------------------------------------------------------
     sigma_u |  .00156825
     sigma_e |  .00333033
         rho |  .18149972   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls difcorrupt diflcorrupt if zone==0

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       102
Estimated autocorrelations =         0          Number of groups   =         6
Estimated coefficients     =         2          Time periods       =        17
                                                Wald chi2(1)       =   2985.10
Log likelihood             =  427.8091          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
  difcorrupt |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 diflcorrupt |    .955741   .0174929    54.64   0.000     .9214556    .9900264
       _cons |  -.0002047   .0003802    -0.54   0.590    -.0009499    .0005404
------------------------------------------------------------------------------
```

Appendix 5M3: Rule of Law

```
. xtreg difrule diflrule, re robust

Random-effects GLS regression                   Number of obs      =       254
Group variable: country_n                       Number of groups   =        15

R-sq:  within  = 0.8928                         Obs per group: min =        16
       between = 0.9982                                        avg =      16.9
       overall = 0.9858                                        max =        17

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   7832.31
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                           (Std. Err. adjusted for 15 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
     difrule |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    diflrule |   .9571734   .0108155    88.50   0.000     .9359755    .9783713
       _cons |   .0002588   .0003426     0.76   0.450    -.0004127    .0009303
-------------+----------------------------------------------------------------
     sigma_u |  .00097201
     sigma_e |  .00345434
         rho |  .07336918   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtgls difrule diflrule

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       254
Estimated autocorrelations =         0          Number of groups   =        15
Estimated coefficients     =         2          Obs per group: min =        16
                                                               avg =  16.93333
                                                               max =        17
                                                Wald chi2(1)       =  17619.03
Log likelihood             =  1067.979          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
     difrule |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    diflrule |   .9651185   .0072709   132.74   0.000     .9508677    .9793692
       _cons |   .0002616   .0002266     1.15   0.248    -.0001826    .0007058
------------------------------------------------------------------------------
```

```
. xtreg difrule diflrule if zone==1,re robust

Random-effects GLS regression                   Number of obs      =       135
Group variable: country_n                       Number of groups   =         8

R-sq:  within  = 0.8436                         Obs per group: min =        16
       between = 0.9985                                        avg =      16.9
       overall = 0.9743                                        max =        17

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   3318.53
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                            (Std. Err. adjusted for 8 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
     difrule |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    diflrule |   .9518227   .0165228    57.61   0.000     .9194386    .9842067
       _cons |   .0000393   .0003428     0.11   0.909    -.0006326    .0007111
-------------+----------------------------------------------------------------
     sigma_u |   .0003594
     sigma_e |  .00350547
         rho |   .0104019   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtgls difrule diflrule if zone==1

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       135
Estimated autocorrelations =         0          Number of groups   =         8
Estimated coefficients     =         2          Obs per group: min =        16
                                                               avg =    16.875
                                                               max =        17
                                                Wald chi2(1)       =   5110.63
Log likelihood             =  567.9245          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
     difrule |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    diflrule |    .954388   .0133502    71.49   0.000     .9282221    .9805539
       _cons |   .0000402   .0003102     0.13   0.897    -.0005677    .0006481
------------------------------------------------------------------------------
```

```
. xtreg difrule diflrule if zone==0,re robust

Random-effects GLS regression                   Number of obs      =       102
Group variable: country_n                       Number of groups   =         6

R-sq:  within  = 0.9354                         Obs per group: min =        17
       between = 0.9967                                        avg =      17.0
       overall = 0.9862                                        max =        17

Random effects u_i ~ Gaussian                   Wald chi2(1)       =  13966.56
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                              (Std. Err. adjusted for 6 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
     difrule |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    diflrule |   .9548923     .00808   118.18   0.000     .9390559    .9707288
       _cons |   .0002522   .0007686     0.33   0.743    -.0012541    .0017585
-------------+----------------------------------------------------------------
     sigma_u |  .00176359
     sigma_e |  .00329029
         rho |  .22317635   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls difrule diflrule if zone==0

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       102
Estimated autocorrelations =         0          Number of groups   =         6
Estimated coefficients     =         2          Time periods       =        17
                                                Wald chi2(1)       =   7288.49
Log likelihood             =  430.4524          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
     difrule |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    diflrule |    .963117   .0112813    85.37   0.000     .9410061     .985228
       _cons |    .000336   .0003704     0.91   0.364      -.00039     .001062
------------------------------------------------------------------------------
```

Appendix 5M4: Political Stability

```
. xtreg difpolitical diflpolitical , re robust

Random-effects GLS regression                   Number of obs      =       254
Group variable: country_n                       Number of groups   =        15

R-sq:  within  = 0.8808                         Obs per group: min =        16
       between = 0.9931                                        avg =      16.9
       overall = 0.9648                                        max =        17

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   2614.06
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                              (Std. Err. adjusted for 15 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
difpolitical |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
diflpoliti~l |   .9491581   .0185644    51.13   0.000     .9127725    .9855436
       _cons |   .0000203   .0009038     0.02   0.982    -.001751     .0017917
-------------+----------------------------------------------------------------
     sigma_u |  .00279659
     sigma_e |  .00765256
         rho |  .11781551   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls difpolitical diflpolitical

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       254
Estimated autocorrelations =         0          Number of groups   =        15
Estimated coefficients     =         2          Obs per group: min =        16
                                                               avg =  16.93333
                                                               max =        17
                                                Wald chi2(1)       =   6962.44
Log likelihood             =  861.8291          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
difpolitical |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
diflpoliti~l |   .9662216   .0115797    83.44   0.000     .9435258    .9889173
       _cons |   .0000182   .0005102     0.04   0.972    -.0009818    .0010183
------------------------------------------------------------------------------
```

```
. xtreg difpolitical diflpolitical if zone==1,re robust

Random-effects GLS regression                   Number of obs      =       135
Group variable: country_n                       Number of groups   =         8

R-sq:  within  = 0.8628                         Obs per group: min =        16
       between = 0.9883                                        avg =      16.9
       overall = 0.9399                                        max =        17

Random effects u_i ~ Gaussian                   Wald chi2(1)       =    470.91
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                               (Std. Err. adjusted for 8 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
difpolitical |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
diflpoliti~l |   .9449328   .0435442    21.70   0.000     .8595877    1.030278
       _cons |  -.0005114   .0012763    -0.40   0.689    -.0030128      .00199
-------------+----------------------------------------------------------------
     sigma_u |  .00268507
     sigma_e |  .00788611
         rho |  .10388406   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls difpolitical diflpolitical if zone==1

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       135
Estimated autocorrelations =         0          Number of groups   =         8
Estimated coefficients     =         2          Obs per group: min =        16
                                                               avg =    16.875
                                                               max =        17
                                                Wald chi2(1)       =   2110.17
Log likelihood             =  457.1267          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
difpolitical |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
diflpoliti~l |   .9590201    .020877    45.94   0.000     .9181019    .9999384
       _cons |  -.0005912   .0007128    -0.83   0.407    -.0019883     .000806
------------------------------------------------------------------------------
```

```
. xtreg difpolitical diflpolitical if zone==0,re robust

Random-effects GLS regression                   Number of obs      =       102
Group variable: country_n                       Number of groups   =         6

R-sq:  within  = 0.8991                         Obs per group: min =        17
       between = 0.9920                                        avg =      17.0
       overall = 0.9643                                        max =        17

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   3924.25
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                              (Std. Err. adjusted for 6 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
difpolitical |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
diflpoliti~l |   .9394226   .0149963    62.64   0.000     .9100305    .9688147
       _cons |   .0001133   .0017532     0.06   0.948    -.0033229    .0035495
-------------+----------------------------------------------------------------
     sigma_u |  .00373781
     sigma_e |  .00793459
         rho |   .1816119   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls difpolitical diflpolitical if zone==0

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       102
Estimated autocorrelations =         0          Number of groups   =         6
Estimated coefficients     =         2          Time periods       =        17
                                                Wald chi2(1)       =   2755.71
Log likelihood             =  340.7778          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
difpolitical |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
diflpoliti~l |    .969888   .0184759    52.49   0.000      .933676      1.0061
       _cons |   .0006797   .0009151     0.74   0.458    -.0011139    .0024732
------------------------------------------------------------------------------
```

Appendix 5M5: Voice and Accountability

```
. xtreg difvoice diflvoice  , re robust

Random-effects GLS regression                   Number of obs      =       254
Group variable: country_n                       Number of groups   =        15

R-sq:  within  = 0.8323                         Obs per group: min =        16
       between = 0.9979                                        avg =      16.9
       overall = 0.9704                                        max =        17

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   3148.25
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                            (Std. Err. adjusted for 15 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
    difvoice |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   diflvoice |   .9639036    .017179    56.11   0.000     .9302333    .9975739
       _cons |   .0007634   .0004288     1.78   0.075     -.000077    .0016038
-------------+----------------------------------------------------------------
     sigma_u |   .0007167
     sigma_e |  .00519263
         rho |  .01869419   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtgls difvoice diflvoice

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       254
Estimated autocorrelations =         0          Number of groups   =        15
Estimated coefficients     =         2          Obs per group: min =        16
                                                               avg =  16.93333
                                                               max =        17
                                                Wald chi2(1)       =   8321.32
Log likelihood             =  962.7261          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    difvoice |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   diflvoice |   .9698167   .0106315    91.22   0.000     .9489794    .9906541
       _cons |   .0007636    .000343     2.23   0.026     .0000914    .0014358
------------------------------------------------------------------------------
```

```
. xtreg difvoice diflvoice if zone==1,re robust

Random-effects GLS regression                   Number of obs      =       135
Group variable: country_n                       Number of groups   =         8

R-sq:  within  = 0.7781                         Obs per group: min =        16
       between = 0.9970                                        avg =      16.9
       overall = 0.9630                                        max =        17

Random effects u_i ~ Gaussian                   Wald chi2(1)       =    432.75
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                             (Std. Err. adjusted for 8 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
    difvoice |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   diflvoice |   .9343542   .0449152    20.80   0.000      .846322    1.022386
       _cons |   .0004929   .0007482     0.66   0.510    -.0009736    .0019594
-------------+----------------------------------------------------------------
     sigma_u |  .00111418
     sigma_e |  .00475012
         rho |  .05214806   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

```
. xtgls difvoice diflvoice if zone==1

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       135
Estimated autocorrelations =         0          Number of groups   =         8
Estimated coefficients     =         2          Obs per group: min =        16
                                                               avg =    16.875
                                                               max =        17
                                                Wald chi2(1)       =   3509.42
Log likelihood             =  517.5858          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    difvoice |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   diflvoice |   .9563658   .0161438    59.24   0.000     .9247245    .9880071
       _cons |   .0004906   .0004503     1.09   0.276     -.000392    .0013732
------------------------------------------------------------------------------
```

```
. xtreg difvoice diflvoice if zone==0,re robust

Random-effects GLS regression                   Number of obs      =       102
Group variable: country_n                       Number of groups   =         6

R-sq:  within  = 0.8660                         Obs per group: min =        17
       between = 0.9979                                        avg =      17.0
       overall = 0.9515                                        max =        17

Random effects u_i ~ Gaussian                   Wald chi2(1)       =   1707.45
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

                                (Std. Err. adjusted for 6 clusters in country_n)
------------------------------------------------------------------------------
             |               Robust
    difvoice |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   diflvoice |   .9798232   .0237123    41.32   0.000     .9333479    1.026298
       _cons |   .0010913   .0006038     1.81   0.071    -.0000922    .0022748
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .00592994
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls difvoice diflvoice if zone==0

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       102
Estimated autocorrelations =         0          Number of groups   =         6
Estimated coefficients     =         2          Time periods       =        17
                                                Wald chi2(1)       =   2000.00
Log likelihood             =  376.1687          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    difvoice |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   diflvoice |   .9798232   .0219095    44.72   0.000     .9368813    1.022765
       _cons |   .0010913   .0006434     1.70   0.090    -.0001697    .0023522
------------------------------------------------------------------------------
```

Appendix 5N: Three-year moving Average estimates; determinants of institutional quality

Appendix 5N1: Regulatory quality

```
. xtreg lregq  lhdi  regin regim lstate lfdig zone lregtrade lgoveff sqlhdi, re

Random-effects GLS regression                   Number of obs      =       251
Group variable: country_n                       Number of groups   =        14

R-sq:  within  = 0.2970                         Obs per group: min =        17
       between = 0.9482                                        avg =      17.9
       overall = 0.8422                                        max =        18

Random effects u_i ~ Gaussian                   Wald chi2(9)       =   1286.20
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       lregq |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        lhdi |   .0923114   .0185431     4.98   0.000     .0559676    .1286552
       regin |   .3746749    .040536     9.24   0.000     .2952257    .4541241
       regim |   .0416343   .1709644     0.24   0.808    -.2934498    .3767184
      lstate |   .0086537   .0025932     3.34   0.001      .003571    .0137363
       lfdig |   .0033467   .0006597     5.07   0.000     .0020536    .0046397
        zone |  -.0033426   .0013152    -2.54   0.011    -.0059203   -.0007648
   lregtrade |    .001791   .0004304     4.16   0.000     .0009475    .0026345
     lgoveff |    .501959   .0342345    14.66   0.000     .4348606    .5690575
      sqlhdi |   .0557463   .0097878     5.70   0.000     .0365626      .07493
       _cons |   .1483485   1.011348     0.15   0.883    -1.833858    2.130555
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .00638509
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls lregq  lhdi  regin regim lstate lfdig zone lregtrade lgoveff sqlhdi

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       251
Estimated autocorrelations =         0          Number of groups   =        14
Estimated coefficients     =        10          Obs per group: min =        17
                                                               avg =  17.92857
                                                               max =        18
                                                Wald chi2(9)       =   1339.57
Log likelihood             =  871.8573          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       lregq |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        lhdi |   .0923114     .01817     5.08   0.000     .0566989    .1279239
       regin |   .3746749   .0397203     9.43   0.000     .2968244    .4525253
       regim |   .0416343   .1675241     0.25   0.804     -.286707    .3699756
      lstate |   .0086537    .002541     3.41   0.001     .0036733     .013634
       lfdig |   .0033467   .0006465     5.18   0.000     .0020796    .0046137
        zone |  -.0033426   .0012887    -2.59   0.009    -.0058684   -.0008167
   lregtrade |    .001791   .0004217     4.25   0.000     .0009645    .0026175
     lgoveff |    .501959   .0335456    14.96   0.000     .4362108    .5677072
      sqlhdi |   .0557463   .0095908     5.81   0.000     .0369486     .074544
       _cons |   .1483485   .9909973     0.15   0.881     -1.79397    2.090668
------------------------------------------------------------------------------
```

Appendix 5N2: Corruption perception

```
. xtreg  lcorrupt  lhdi   corruptin corruptim lstate lfdig zone lregtrade lgoveff sqlhdi  sqlstate, re

Random-effects GLS regression                   Number of obs      =       251
Group variable: country_n                       Number of groups   =        14

R-sq:  within  = 0.4516                         Obs per group: min =        17
       between = 0.9550                                        avg =      17.9
       overall = 0.8678                                        max =        18

Random effects u_i ~ Gaussian                   Wald chi2(10)      =   1575.89
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    lcorrupt |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        lhdi |    .133448   .0218854     6.10   0.000     .0905535    .1763426
   corruptin |   .3413926   .0434325     7.86   0.000     .2562665    .4265187
   corruptim |  -3.057975    .399081    -7.66   0.000    -3.840159    -2.27579
      lstate |   .0632914   .0286484     2.21   0.027     .0071416    .1194412
       lfdig |   .0028351   .0007162     3.96   0.000     .0014313    .0042389
        zone |   .0029589   .0014516     2.04   0.042     .0001138    .0058041
   lregtrade |  -.0020946   .0005427    -3.86   0.000    -.0031584   -.0010308
     lgoveff |   .3679577   .0377794     9.74   0.000     .2939113     .442004
      sqlhdi |   .0739593   .0115882     6.38   0.000      .051247    .0966717
    sqlstate |  -.0122842   .0056628    -2.17   0.030    -.0233831   -.0011852
       _cons |   17.97045    2.32075     7.74   0.000     13.42187    22.51904
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .00671005
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls  lcorrupt  lhdi   corruptin corruptim lstate lfdig zone lregtrade lgoveff sqlhdi  sqlstate

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       251
Estimated autocorrelations =         0          Number of groups   =        14
Estimated coefficients     =        11          Obs per group: min =        17
                                                               avg =  17.92857
                                                               max =        18
                                                Wald chi2(10)      =   1648.12
Log likelihood             =  839.1038          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
    lcorrupt |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        lhdi |    .133448   .0214004     6.24   0.000      .091504    .1753921
   corruptin |   .3413926   .0424701     8.04   0.000     .2581527    .4246325
   corruptim |  -3.057975   .3902382    -7.84   0.000    -3.822828   -2.293122
      lstate |   .0632914   .0280136     2.26   0.024     .0083857     .118197
       lfdig |   .0028351   .0007004     4.05   0.000     .0014624    .0042078
        zone |   .0029589   .0014195     2.08   0.037     .0001768     .005741
   lregtrade |  -.0020946   .0005307    -3.95   0.000    -.0031348   -.0010544
     lgoveff |   .3679577   .0369423     9.96   0.000      .295552    .4403633
      sqlhdi |   .0739593   .0113314     6.53   0.000     .0517502    .0961685
    sqlstate |  -.0122842   .0055374    -2.22   0.027    -.0231372   -.0014311
       _cons |   17.97045   2.269327     7.92   0.000     13.52265    22.41825
------------------------------------------------------------------------------
```

Appendix 5N3: Rule of Law

```
. xtreg lrule rulein ruleimm lhdi lstate lfdig zone lregtrade lgoveff sqlhdi, re

Random-effects GLS regression                   Number of obs      =       251
Group variable: country_n                       Number of groups   =        14

R-sq:  within  = 0.3496                         Obs per group: min =        17
       between = 0.9563                                        avg =      17.9
       overall = 0.8999                                        max =        18

Random effects u_i ~ Gaussian                   Wald chi2(9)       =   2111.95
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       lrule |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      rulein |   .2985956   .0325062     9.19   0.000     .2348845    .3623066
     ruleimm |  -2.646007   .3647826    -7.25   0.000    -3.360968   -1.931046
        lhdi |   .0831048   .0232334     3.58   0.000     .0375682    .1286414
      lstate |   .0134164   .0032416     4.14   0.000      .007063    .0197699
       lfdig |   .0040564   .0007871     5.15   0.000     .0025137    .0055991
        zone |  -.0005288   .0016252    -0.33   0.745    -.0037141    .0026564
   lregtrade |    .002289   .0005231     4.38   0.000     .0012638    .0033142
     lgoveff |   .4178854   .0500632     8.35   0.000     .3197634    .5160075
      sqlhdi |   .0401699   .0120709     3.33   0.001     .0165114    .0638284
       _cons |   15.65366   2.145623     7.30   0.000     11.44831      19.859
-------------+----------------------------------------------------------------
     sigma_u |  .00032687
     sigma_e |  .00652528
         rho |  .00250308   (fraction of variance due to u_i)
------------------------------------------------------------------------------

. xtgls lrule rulein ruleimm lhdi lstate lfdig zone lregtrade lgoveff sqlhdi

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       251
Estimated autocorrelations =         0          Number of groups   =        14
Estimated coefficients     =        10          Obs per group: min =        17
                                                               avg =  17.92857
                                                               max =        18
                                                Wald chi2(9)       =   2256.81
Log likelihood             =  818.6428          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
       lrule |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      rulein |   .2976614   .0316688     9.40   0.000     .2355916    .3597312
     ruleimm |  -2.688642   .3577805    -7.51   0.000    -3.389878   -1.987405
        lhdi |   .0840178   .0227577     3.69   0.000     .0394135    .1286221
      lstate |   .0136781   .0031778     4.30   0.000     .0074497    .0199064
       lfdig |   .0041278   .0007732     5.34   0.000     .0026123    .0056433
        zone |    -.00063   .0015827    -0.40   0.691     -.003732     .002472
   lregtrade |   .0022814   .0005102     4.47   0.000     .0012815    .0032813
     lgoveff |   .4135397   .0488699     8.46   0.000     .3177564    .5093231
      sqlhdi |   .0406898   .0118244     3.44   0.001     .0175143    .0638653
       _cons |   15.90767   2.103799     7.56   0.000      11.7843    20.03104
------------------------------------------------------------------------------
```

Appendix 5N4: Political Stability

```
. xtgls lpolitical politicalin politicalim lhdi lstate lfdig zone lregtrade lgoveff sqlhdi sqlstate

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       251
Estimated autocorrelations =         0          Number of groups   =        14
Estimated coefficients     =        11          Obs per group: min =        17
                                                               avg =  17.92857
                                                               max =        18
                                                Wald chi2(10)      =    576.15
Log likelihood             =  586.3603          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
  lpolitical |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 politicalin |   .1030623   .0465891     2.21   0.027     .0117494    .1943752
 politicalim |  -6.366906   .5114379   -12.45   0.000    -7.369306   -5.364506
        lhdi |  -.0144817   .0571871    -0.25   0.800    -.1265664     .097603
      lstate |   .0695273   .0753228     0.92   0.356    -.0781026    .2171573
       lfdig |   .0040814   .0019082     2.14   0.032     .0003413    .0078214
        zone |   .0098856   .0040072     2.47   0.014     .0020316    .0177396
   lregtrade |   .0007962   .0013516     0.59   0.556    -.0018529    .0034454
     lgoveff |   .5260419   .0964534     5.45   0.000     .3369968     .715087
      sqlhdi |   .0084045   .0299339     0.28   0.779    -.0502649    .0670739
    sqlstate |  -.0148427   .0147582    -1.01   0.315    -.0437682    .0140828
       _cons |   36.70416   2.966288    12.37   0.000     30.89034    42.51797
------------------------------------------------------------------------------

. xtreg lpolitical politicalin politicalim lhdi lstate lfdig zone lregtrade lgoveff sqlhdi sqlstate, re

Random-effects GLS regression                   Number of obs      =       251
Group variable: country_n                       Number of groups   =        14

R-sq:  within  = 0.2718                         Obs per group: min =        17
       between = 0.8902                                        avg =      17.9
       overall = 0.6965                                        max =        18

Random effects u_i ~ Gaussian                   Wald chi2(10)      =    550.90
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

------------------------------------------------------------------------------
  lpolitical |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
 politicalin |   .1030623   .0476448     2.16   0.031     .0096802    .1964443
 politicalim |  -6.366906   .5230271   -12.17   0.000     -7.39202   -5.341792
        lhdi |  -.0144817    .058483    -0.25   0.804    -.1291062    .1001428
      lstate |   .0695273   .0770296     0.90   0.367    -.0814479    .2205026
       lfdig |   .0040814   .0019515     2.09   0.036     .0002566    .0079062
        zone |   .0098856    .004098     2.41   0.016     .0018536    .0179176
   lregtrade |   .0007962   .0013823     0.58   0.565     -.001913    .0035054
     lgoveff |   .5260419    .098639     5.33   0.000      .332713    .7193708
      sqlhdi |   .0084045   .0306122     0.27   0.784    -.0515943    .0684033
    sqlstate |  -.0148427   .0150926    -0.98   0.325    -.0444237    .0147382
       _cons |   36.70416   3.033504    12.10   0.000      30.7586    42.64972
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .01694469
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Appendix 5N5: Voice and Accountability

```
. xtgls lvoice voicein voiceimm lhdi lstate lfdig zone lregtrade lgoveff sqlhdi sqlstate

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       251
Estimated autocorrelations =         0          Number of groups   =        14
Estimated coefficients     =        11          Obs per group: min =        17
                                                               avg =  17.92857
                                                               max =        18
                                                Wald chi2(10)      =    848.61
Log likelihood             =  689.4618          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      lvoice |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     voicein |   .4655334   .0512886     9.08   0.000     .3650097    .5660572
    voiceimm |   .4924802   .2476682     1.99   0.047     .0070594     .977901
        lhdi |   .1622035    .037802     4.29   0.000      .088113     .236294
      lstate |    .001192   .0512213     0.02   0.981    -.0991999     .101584
       lfdig |   .0043435   .0012821     3.39   0.001     .0018305    .0068565
        zone |  -.0026147   .0026975    -0.97   0.332    -.0079018    .0026724
   lregtrade |   .0004928   .0009926     0.50   0.620    -.0014527    .0024382
     lgoveff |   .5474167   .0678575     8.07   0.000     .4144184     .680415
      sqlhdi |   .0961413   .0198042     4.85   0.000     .0573259    .1349567
    sqlstate |   .0015423   .0100808     0.15   0.878    -.0182156    .0213002
       _cons |  -2.739776   1.518836    -1.80   0.071     -5.71664    .2370868
------------------------------------------------------------------------------

. xtreg lvoice voicein voiceimm lhdi lstate lfdig zone lregtrade lgoveff sqlhdi, re

Random-effects GLS regression                   Number of obs      =       251
Group variable: country_n                       Number of groups   =        14

R-sq:  within  = 0.3864                         Obs per group: min =        17
       between = 0.8153                                        avg =      17.9
       overall = 0.7546                                        max =        18

Random effects u_i ~ Gaussian                   Wald chi2(9)       =    430.45
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      lvoice |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     voicein |   .3868017    .068347     5.66   0.000      .252844    .5207594
    voiceimm |   .8277249   .2153009     3.84   0.000     .4057429    1.249707
        lhdi |   .0661596   .0342647     1.93   0.054     -.000998    .1333172
      lstate |   .0020948   .0048939     0.43   0.669    -.0074971    .0116866
       lfdig |   .0031227   .0011764     2.65   0.008      .000817    .0054284
        zone |   .0016373    .003543     0.46   0.644    -.0053069    .0085816
   lregtrade |  -.0000639   .0009554    -0.07   0.947    -.0019365    .0018086
     lgoveff |   .7465987   .0763166     9.78   0.000      .597021    .8961765
      sqlhdi |   .0429589    .017804     2.41   0.016     .0080636    .0778542
       _cons |  -5.011267   1.343482    -3.73   0.000    -7.644443   -2.378092
-------------+----------------------------------------------------------------
     sigma_u |   .0040495
     sigma_e |  .00962996
         rho |  .15025892   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Appendix 5O: Definition of the variables used in the analysis

Variable	Indicators	Definition
state	proxy for state capacity	total government expenditure as a percentage of GDP
estate	General government final consumption expenditure (constant 2010 US$)	General government final consumption expenditure (constant 2010 US$)
hdi	proxy for development level	human development index
fdig	FDI inflow as a percentage of GDP	Percentage of Gross Domestic Product
fdit	Foreign direct investment: Inward flows and stock	US Dollars at current prices in millions
regtrade	regional trade as % of GDP	regional imports plus exports divided by GDP Constant 2010 US$
exports	total ECOWAS exports by country	total ECOWAS exports by country
imports	total ECOWAS imports by country	total ECOWAS imports by country
ecowas	total ECOWAS trade (export plus imports	total ECOWAS trade (export plus imports
corrupt	Control of Corruption	Control of Corruption
goveff	Government Effectiveness	Government Effectiveness
political	Political Stability and Absence of Violence/Terrorism	Political Stability and Absence of Violence/Terrorism
regqual	Regulatory Quality	Regulatory Quality
rule	Rule of Law	Rule of Law
voice	Voice and Accountability	Voice and Accountability
Log Initial IQ	Initial value of institutional quality	The initial values of each of the institutional quality indices. This is the 1996 values for each country.
Log IQ Ecowas (V-i)	IQ of the rest of ECOWAS members	IQ of the rest of ECOWAS members (it is the summation of the other ECOWAS IQ values)
sqlhdi	Log of squared HDI	The log of the squared human development index
sqlstate	Log of squared state capacity	Log of squared state capacity